

THE CHRONICLE OF HIGHER EDUCATION

CHRONICLE OF HIGHER EDUCATION & RESEARCH

★ January 1974

Re. 1

**Chemistry in
Engineering Education**

Science Congress Special

**Social Requirements
of New Technology**

**Science & Technology
for Development**

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At a meeting of the United Nations Advisory Committee on the Application of Science and Technology to Development held at Palais des Nations, Geneva, Mr. M. G. K. Menon (right), of India, Chairman of the session and Mr. R. C. Desai (left), Acting Director, UN Office of Science and Technology, UN Department of Economic and Social Affairs.

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THE SALES & DISTRIBUTION OFFICER
Publications & Information Directorate, CSIR
Hillside Road, New Delhi-110012

UNIVERSITY NEWS

Vol. XII
No. 1



January
1974

A Monthly Chronicle of Higher Education

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Editor : ANJNI KUMAR

FOUNDATIONS OF SCIENCE

Pandit Jawaharlal Nehru in one of the sessions of the Indian Science Congress had said, "It is science alone that can solve the problems of hunger and poverty, insanitation and illiteracy, of superstition, customs and traditions, of vast resources running to waste in a rich country inhabited by starving people. Who indeed could afford to ignore science today?" He always favoured a practical approach to science so that it could be used from the functional point of view of the country. India has since then built an infrastructure of science and technology to bring science to the doors of people and has harnessed it to the development and growth of the country. Yet the crux of the problem has eluded the solution. Science has not been vigorously applied to tackle the entire national resources of the country. We are still faced with the tremendous problems of unemployment, economic depression and poverty. On top of it the year has recorded the worst rise in the prices of essential commodities.

The Science Congress would be holding its 61st annual session from January 3 to 9 at Nagpur University in their golden jubilee year. Over 3,000 delegates are expected to attend the session. Amongst them would be about 100 foreign delegates. A quick look at the schedules of lectures, discussions and symposia of the congress reveals the diversity of subjects to be discussed at some length. The more important topics are: Indian Agriculture at Cross Roads; Science Technology and Society; Role of Engineers in Community Development; Malnutrition in Developing Countries; Population explosion and control measures; Integration of nations through Science.

There seems to be an all round awareness to the importance of science in the modernisation of society today. The need for providing better scientific foundation for educational structure is being felt everywhere and efforts are already on to develop a creative scientific faculty in institutions of higher learning. We are living in a "knowledge based" world and each one of us, the Government, the people, the students and the teachers must take knowledge seriously and not at the superficial face value. The Indian National Science Academy has done well in organising a series of popular lectures for the talented science students and teachers of Delhi. These lectures would be given by leading scientists on every Saturday and will be fully illustrated by short films on the subjects, visual aids and experimental models. The exercise is sure to provide a boost to the development of science programme and will inspire many motivated young minds to the study of science.

About them...

This year the Indian Science Congress Association's 61st Annual session begins at Nagpur.

The General President
Prof. R. S. Mishra



BORN on August 10, 1918, at Ajgain, District Unnao, U.P., Dr. Ratan Shanker Mishra, Professor and Head of the Department of Mathematics and Dean, Faculty of Science, Banaras Hindu University had his earlier education at Unnao and Lucknow. He took his B.Sc. Hons. and M.Sc. Degrees from Lucknow University in 1942 and 1943 respectively and has consistently brilliant academic record to his credit. He is the first Ph.D. (1947) of Delhi University in all the Faculties and also the first D.Sc. (1952), after Ph.D. of Lucknow University.

Currently he is the Professor and Head of the Department of Mathematics and Statistics (since 1968) and Dean, Faculty of Science at B.H.U., Varanasi.

He has visited a number of countries like U.S.A., Canada, U.K., Ceylon, Nepal, Israel, Denmark and Kuwait as Visiting Professor and to attend conferences. Besides he has been on lecture tours in a number of institutions of higher learning in the world.

The especialisations of Prof. Mishra are Differential Geometry, Relativity and Fluid Mechanics in which fields he has been working for the last 30 years and has published more than 175 papers. More than 40 research scholars in Mathematics and Physics working under his guidance have obtained their Ph.D. and D.Sc. Degrees from the Universities of Delhi, Lucknow, Gorakhpur, Allahabad and Banaras Hindu University and more than 300 research papers have been written under his guidance. He has done outstanding work in the fields of Differential Geometry, Relativity and Fluid Mechanics which has been widely quoted in standard journals and standard works like 'Hlavaty's Einsteins' Unified Field Theory and Schoutens' Ricci Calculus'. The solutions of Einstein's Unified Field Theory which he gave in 1958 are the best solutions known so far. These solutions had engaged the attention of

Scientists for a long time and physicists like Schrodinger thought that it was next to impossible to give a tensorial solution to these equations. He has developed his own index free notation in the theory of almost complex, almost contact and almost product manifolds. This method is most modern. He was the first to deal with differential geometry of rectilinear congruences in tensor notation.

Prof. Mishra is Fellow of all the three Scientific Academies of India—Indian National Science Academy (F.N.A.), Indian Academy of Sciences (F.A.Sc.), National Academy of Sciences (F.N.A.Sc.). For his personal qualities he was awarded Padma Shri by the President of India on Republic Day in 1971.

He holds several offices of importance in Indian Science Congress Association and National Academy of Sciences. He is the member of the Indian National Committee for International Mathematical Union and is associate adviser member of Centro Superiore Di Logica E Scienze Comparete (Italy). He is the Editor-in-Chief of *Prajna* and the mathematical journal *Progress of Mathematics*. He is on the editorial board of several national and international journals like 'Tensor (published in Japan), Indian Journal of Pure and Applied Mathematics, Proceedings of National Academy of Sciences', Vikram Mathematical Journal, Gyanabh, Bulletin of Calcutta Mathematical Society, Ganit etc. He is the Chairman of All India Panels in Mathematics and in Statistics and U.P. Panels in Mathematics and in Statistics for writing of text books. He is also the member of various bodies of different Universities. In the past also he has held different offices with distinction in different Universities, Institutions and Scientific Societies and Academies.



DR. AJIT KUMAR MAITY
President,
Physiology Section

Dr. A. K. Maiti

ELDEST son of Krishna Dhan Maiti, Dr. Ajit Kumar Maiti, born on December 20, 1927 at Nijbalia, Howrah, is the Head of the Department of Biochemistry and Biophysics, University College of Medicine, Calcutta University. Educated at Garbalia R.C. Manna Institute, Scottish Church College, Bangabasi College, he earned B.Sc. (Hons.) in 1947 and M.Sc. (1st Class) in Physiology (1949) from Calcutta University. He passed his M.B. B.S. from Calcutta Medical College (1956).

He obtained his Ph.D. in Physiology. From 1954 to 1959, Dr. Maiti served in several institutions: Vidyasagar College and University College of Science as Lecturer in Physiology; Institute of Postgraduate Medical Education and Research and R.G. Kar Medical College as research associate and research officer, and University College of Medicine as extramural teacher.

In 1959 Dr. Maiti was awarded the visiting research scientist appointment of National Academy of Sciences, U.S.A. for two years, at which time he was trained in neurophysiology and clinical EEG from the University of Michigan, Ann Arbor, U.S.A. On his appointment as Reader and first whole-time Head of the Department of Physiology, he joined the University College of Medicine in 1961, and until 1968 initiated and organized Applied Physiology at different levels of post graduate degree (M.Sc., M.D.) and diploma courses under the Faculty of Medicine. In 1968 he took up as Head of the Department of Biochemistry (section of Biophysics attached with it) in 1972.

His research works on experimental epilepsy related to spinal cord exposed a new understanding of the peripheral reflex mechanism involved in epileptic convulsions,

insulin secretion and blood pressure regulation. His studies on the action of caffeine on brain explained the mechanism of its enhanced cortical excitability and the timing of the coffee break. His investigations on neurotrophic influences following surgical and pharmacological denervation demonstrated some modification of receptor sites through altered mast cell activity at the loci. This helped to explain the processes involved in certain degenerative changes under diabetic complications and neuropathy during loss of central nervous influences. His work related to the effect of urotenism (caudal neurosecretory substance of fish) in modifying the contraction of swim bladder indicated some neuroendocrine influences involved in the regulation of buoyancy of fresh water teleost fishes.

Other areas of his interest with his associates include the study of sympathetic influences in vitiligo and various neurodermatitis of clinical entity, and the effect of prolonged use of oral contraceptives on the changes of brain excitability and uterine motility. While visiting Professor at Howard University, Washington, D.C., U.S.A., his work on the effect of insulin demonstrated some direct depressing actions on certain cardiovascular reflexes. Presently he is engaged in exploring the cerebellar influences on various subcortical structures in modulating the epileptogenic seizure discharges at the Centre for Brain Research of the University of Rochester. Dr. Maiti has 123 research publications to his credit along with his associates and a large number of students (15) received there Ph.D. degree under his guidance. Recently, he has been awarded the Shanti Swarup Bhatnagar Memorial prize in Medical Sciences for the year 1971 by the C.S.I.R., Government of India.

During last few years, Dr. Maiti was invited by several Inter-

national Societies, when he presented research papers and participated in different sessions either as chairman or co-chairman: amongst them are the Brain Research Work Shop Seminar on brain function in relation to Nutrition and Neuroendocrines, held at Peradeniya, Ceylon through IBRO, UNESCO; 7th International Summer School for Brain Research held at Amsterdam by Netherlands Central Institute for Brain Research; International Symposia on Vascular Muscles, held at Tubingen, Germany by German Angiological Society; International symposia on central and peripheral adrenergic systems at Warsaw, Poland by Polish Physiological Society and at Munich at the XXV-IUPS Congress (1971). He has travelled widely and participated in scientific sessions held at various Brain Research Centers of Zurich, Vienna, Copenhagen, Goteborg, Paris, London, Rome and different centers of the U.S.A.

Mr. Jivan Datt

RECENTLY retired as Chief Engineer, Concrete Association of India and Senior Executive, Associated Cement Cos, and also Editor, *Indian Concrete Journal*, Mr. Jivan Datt was born on October 7, 1909. He is at present Adviser, Engineering Projects, Mafatlal Services (P) Ltd.

Mr Datt had his early education at Shakargarh which came to limelight during the Indo-Pak war. Backed by brilliant academic career, he passed the B.Sc. degree examination with first class honours from the Government College, Lahore and later graduated in Civil Engineering from the Thomson College of Engineering, Roorkee. He is Fellow, Institution of Engineers (India); member, American Society of Civil Engineers; member Institu-



MR. JIVAN DATT
President,
Engineering & Metallurgy Section

tion of Highway Engineers, London and member, Indian Institute of Road Transport; Indian Roads Congress and several other technical organizations.

He specialized in concrete structures, and the first R.C. frame structure built in 1936 in Calcutta goes to his credit. Parry's Corner, the then tallest building in Madras, built in 1939 and a Cinema hall with rigid frame constructed in 1942 in Bangalore were designed by him. He has been an examiner for the masters degree in Highway Engineering and Concrete Technology conducted by the IIT's and other institutions. Mr. Datt has been actively associated with Indian Standard Institution. He has contributed over 30 papers to various technical journals.

The community development programme of the Associated Cement Cos around their cement factories—the first in community development undertaken by any industrial organization in India on 'Self Help' basis was launched by him. An active Rotarian for over 26 years, he was President the Patna Rotary Club, Director of of the Calcutta Club, and Chairman, Consumer Protection Committee, Rotary Club of Bombay.

He was a Council Member of the Institution of Engineers (India) for nearly 16 years; and the founder of the Bihar Centre of the Institution of Engineers (India) and its Chairman during 1952-53. He has been a permanent member of the Committee of the Indian Science Congress (Engineering and Metallurgy Section) for the past 20 years. He was a member of the Senate of the Patna University for 4 years and of the Roorkee University for 10 years (again elected for the term 1973-76). He has been a member of the Governing Council of the Indian Institute of Road Transport; a member of the Executive Committee of the Indian Roads and Transport Development Association; a member of the Council of the Indian Roads Congress and its Vice-President during 1968-69; and Vice-President and member of the Council of the Safety First Association of India.

He has been intimately asso-

ciated with several social and welfare organizations, such as, the Working Committee of the Bihar State and the Central Executive Committee of the Indian Conference of Social Work; Vice-President, Association of Social and Moral Hygiene, Bihar State Branch; Founder-President, Punjabi Bradree Patna; Founder Secretary Youth Hostel Association, Bihar State; Member Governing Council, Kishore Dal, etc. Deserving special mention is his devoted work towards the rehabilitation of over 1200 refugee families from Pakistan in Patna.

Prof. H.S. Asthana

BORN on August 27, 1922, Prof. H.S. Asthana, earned a first class Master's degree and Doctoral degree from Lucknow University. He was a casual student, College of Science, Calcutta University, Doctoral Fellow, Lucknow University, Post-doctoral Fellow and Guest, University of Chicago. Trained under N.N. Sen Gupta Ph.D., (Harvard) and S.C. Mitra, Ph.D (Leipzig) in India and Wolfgang Kohler, Heinrich Kluver, L.I. Thurstone, S.J. Beck and E.C. Tolman abroad, Prof. Asthana was appointed Visiting Professor and Honorary Research Associate at George Washington and Harvard Universities respectively. He is recipient of Smith-Mundt, Watumul and Fulbright (twice) awards. Sessional president Akhil Bhartiya Darshan Parishad, Jaipur, Congress International du Rorschach et des Methodes Projectives, Paris and Psychological Problems of Armed Forces, Ministry of Defence, New Delhi. He participated in International Rorschach Gesellschaft, Freiburg, International UNESCO-NICD Conference on Leadership in S-E Asia, Mussorie, Congress International du Rorschach et des Methodes Projectives, Paris and International Mental Health Conference, London.

He also worked in and visited Psychological laboratories in U.K., U.S.A., Japan and European countries. Member of various aca-



PROF. H. S. ASTHANA
President,
Psychology & Educational Science
Section

demic and professional bodies, he taught at Universities of Lucknow, Agra, Gorakhpur and Saugar during the last 30 years. His area of specialization is Personality and Social Psychology specially the Rorschach and Cognitive processes.

He has over 60 research papers, published to his credit.

Prof. Chopra

BORN on October 8, 1931, Professor S. R. K. Chopra, had his early education at Delhi. He got B.Sc. Honours degree in Zoology in 1951 and M.Sc. in Anthropology in 1953 from the University of Delhi. In 1953 he proceeded to Zurich to work with the eminent Primatologist, Professor A.H. Schultz. In 1955 he obtained his Ph.D. degree from the University of Zurich.

He was then appointed to a University Research Fellowship at the Department of Anatomy, University of Birmingham, where he was associated with Professor Sir Solly Zuckerman, K.C.B., F.R.S., the then Director of the Department of Anatomy.

In 1957-58, he was invited to lecture at the Duckworth Laboratory, Faculty of Archaeology and Anthropology, University of Cambridge.

He came back to India in 1959 and was appointed to head the newly created Department of Anthropology at Panjab University, Chandigarh. In 1964 he was once again invited by the University of Birmingham and was appointed to the coveted Leverhulme Visiting Fellowship. A year later he was appointed Visiting Professor of Anthropology at the University of Kiel (W. Germany).

Prof. Chopra has been a recipient of the Wenner-Gren Foundation research awards for the years 1955-56 and 1966-67. He is Convener of the Indian Association of Physical Anthropologists and a member of the permanent council of the International Association of Human Biologists, Paris.

He is also a member of the National Sectional Committee for Human Adaptability (India) under the International Biological programme. He has also been a member of the Central Advisory Board of Anthropological Survey of the Government of India, Chairman of the Palaeoanthropology and Anthropogenesis Session of the International Congress of Anthropological and Ethnological Sciences held at Tokyo in 1968.

He has directed a number of national and international research projects and has made outstanding contributions in the fields of Growth and Primatology. He is also responsible for the recovery of important fossil primates in the Indian Sivaliks and has published a number of research papers in national and international journals.

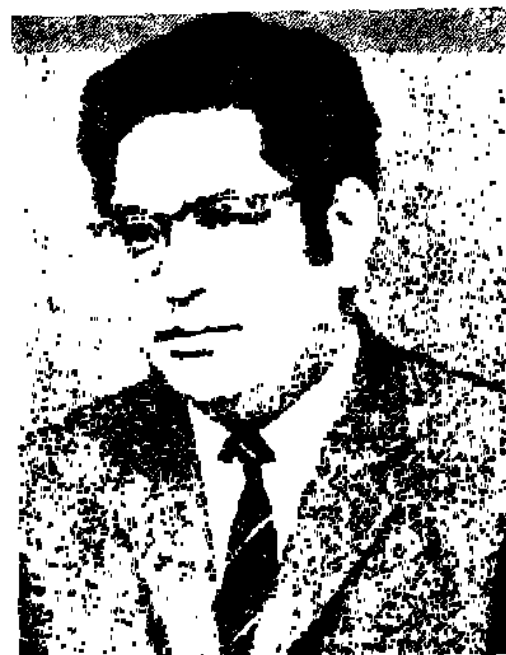
Dr. B. Choudhury

AFTER passing the I.Sc. examination Dr. B. Choudhury was sent by the Bihar Government to study Agriculture at Kanpur in 1942. He had the distinction of being the first candidate from Bihar to have secured 1st Class with Horticulture as a special subject in B.Sc. (Agri.) in 1946. Born on February 6, 1926, he had his early education in Bihar.

He joined the Bihar Agricultural Department soon after, and was sent for post-graduate training at the Indian Agricultural Research Institute, New Delhi in 1950.

Dr. Choudhury was selected under the Colombo Plan and joined the Melbourne University, Australia in 1952. He was the first Asian under Colombo Plan in Australia to be awarded Ph.D. degree in 1954.

Three years after rejoining the Bihar Agricultural Department, he joined the Division of Horticulture, IARI, New Delhi as Vegetable Breeder in 1957. He was appointed Chief Vegetable Specialist in 1966 and took over as Head of the Division of Horticulture in 1969. He has been heading the newly formed Divi-



PROF. S. R. K. CHOPRA
President,
Anthropology & Archaeology Section



DR. B. CHOUDHURY
President,
Agricultural Sciences Section



DR. B. R. SEN GUPTA
President,
Medical & Veterinary Sciences Section



DR. H. S. CHAUDHRY
President,
Zoology & Entomology Section

sion of Vegetable Crops and Floriculture since 1970.

He toured U.S.A., Mexico, Canada, the UK, Netherlands and Africa in connection with vegetable research, development and teaching. He has devoted about twentyfive years for improvement of vegetable crops and is responsible for releasing a large number of high yielding varieties and hybrids of different vegetables.

Author of a book on 'Vegetables', he has published about 120 original scientific and popular articles in different journals in India and abroad.

An Hony. Secretary of the Indian Society of Vegetable Science and Delhi Agri-Horticultural Society, he is a Council member of the International Society of Horticultural Science and is Vice-Chairman for Northern India of its Tropical and Sub-tropical Horticultural Committee. He worked as the Recorder of the Section of Agricultural Sciences of the Indian Science Congress in 1969-70.

Dr. Sen Gupta

ORIGINALLY belonging to Faridpur district of East Bengal (now Bangladesh), the family of Dr. B. R. Sen Gupta has settled in Calcutta for a long time. Born in 1930, Dr. Sen Gupta had his earlier education in Jagadbandhu Institution (Ballygunge) and Presidency College, Calcutta, and medical education in Calcutta Medical College. Having a uniformly good career, and also winning prizes, certificates, gold medal at different stages, he graduated in Medicine from Calcutta University in 1953, passed the M.D. examination in 1959, obtained M.R.C.P. in 1962 and F.R.C.P. in 1973.

He worked in many teaching Hospitals in Calcutta and abroad and as specialist physician in mofussil districts of West Bengal. He is now a senior member of the teaching staff (Department of Medicine) and visiting Physician, Medical College, Calcutta. He

conducts the diabetic clinic of Medical College and is a Presidency Surgeon to the Government of West Bengal.

A member of the Senate, University of Calcutta, he is also a lecturer (extramural) and a member of a Faculty of the same University. He is the Scientific Secretary, Diabetic Association of India (Calcutta Branch) and elected member of the Executive Committee of Calcutta Medical Club and Calcutta University Institute. He is actively associated with many other social, academic and sports organisations in India.

He has to his credit more than three dozens of publications (scientific papers, original articles, books, booklets, etc.), and has delivered scientific lectures over radio and at different places in the country.

Dr. H. S. Chaudhry

BORN in Calcutta on October 24, 1917, Dr. Hari Shanker Chaudhry, had his entire education at Allahabad. He passed the M.Sc. Zoology examination in 1940 from the Allahabad University, topping the list of successful candidates. He was awarded the Empress Victoria Readership by the University for carrying on researches in Animal Cytology, and earned the D. Phil agree in 1944.

As a Lecturer in Zoology at (P.E.S. Class II) Ravenshaw College, Cuttack (1941-44), later he was appointed Professor in P.E.S. Class I (1947-49). From 1944 to 1952 he was on the teaching staff of Allahabad University.

He was appointed in P.E.S. Class I as Professor and Head of the Zoology Dept., D.S.B. College, Nainital (1952-58). Since 1958, he is occupying the chair of the Professor and Head of the Zoology Department at Gorakhpur University and is now a Senior Professor.

Dean Faculty of Science (1965-68) and the Dean Faculty of Agriculture (1969-71) in the Gorakhpur University, he is a Fellow of the

National Academy of Sciences and has been associated with various academic and scientific organizations — coopted member of Technical Terminology in Hindi Committee, Government of India; member of the Subject Panel Committee, Hindi Book Production Programme; convener of the Zoology Committee, Hindi Granth Academy, U.P. and member of the U.P. State C.S.I.R. Research Grants Committee. He has also been a member of the Working Group of Fifth Five-Year Plan on Fisheries Development, and convener of a Fisheries Sub-working Group of the U.P. Government.

He has extensively travelled abroad and attended international conferences. He was nominated as a University delegate to the Commonwealth Universities Conference London (1963). For some months he was associated with Prof. Neiuwkoop as a Visiting Research Scientist at the International Institute of Embrology, Utrecht Netherlands, on problems relating to Developmental Biology. He has been the Recorder at the First All India Zoology Congress, Jabalpur (1959), and Sectional President at the Second All India Zoology Congress, Varanasi (1963).

Prof. Singh

PROF. RAMA NAGINA SINGH, D.Sc., Professor and Head, Department of Botany, Banaras Hindu University, Varanasi (born: August 2, 1915), took his B.Sc. in 1936, M.Sc. in 1938 and D.Sc. in 1946 from the same University.

His interest in Botany was created by the late Dr. Winfield Dudgeon, at Ewing Christian College, Allahabad. His early interest in Botany was crystallized in Algae under the able and inspiring guidance of his revered teacher the late Professor Y. Bharadwaja.

Since June 1, 1938 he has been in continuous service of the Banaras Hindu University, in various capacities. He had the unique opportunity of serving under a galaxy of Vice-Chancellors, great

personalities, public men, patriots, educationists and scholars, to mention only two of them, the late Mahamana Pandit Madan Mohan Malaviya and Dr. S. Radhakrishnan, whose kindness he has ever enjoyed. He has been greatly influenced by their exemplary personalities and life.

Since 1936, when he first started research work on Algae as an M.Sc. student he has continued it uninterrupted and has indeed enjoyed "Living with algae", for nearly four decades by now. For him it has been a unique devotion to the study of algae. Even in the early forties of the century his contributions on the green alga *Frittschiella tuberosa* and the algae ancestry of land plants have met with universal accord amongst botanists and it will ever remain a landmark in phycology and botany.

His researches have been extensively quoted in international publications and generally acclaimed throughout the world. He has built a strong school of Algae or Phycology at the Banaras Hindu University which has acquired an international reputation and perhaps can be considered a rare research centre on algae in the world.

He was the first recipient of the I.C.I. research fellowship for biology-botany, from 1945-1947. He spent two years (1952-1954) at the University College, London and had the rare opportunity of personal contacts with the two doyens of botany, late Professors W.H. Pearsall, F.R.S. and F.E. Fritsch, F.R.S. He visited the University of Wisconsin in Madison on an International Educational Exchange Programme, from 1959 to 1960 and worked with Professors R.H. Burris in biochemistry and Hans Ris in electron microscopy.

He has participated in International Congresses of Botany, Genetics, Limnology, Soil Science, and the Third International Congress on the Global Impact of Microbiology. At the last Congress he acted as the chairman for the main session on 'Blue-green Algae and Rice Cultivation'. He has travelled widely and addressed symposia and colloquia in India,



PROF. R. N. SINGH
President,
Botany Section



MR. MUKTI NATH
President,
Geology & Geography Section



DR. L. S. KOTHARI
President,
Physics Section



PROF. B. C. HALDAR
President,
Chemistry Section

U.S.A., the U.K. and Japan. He participated in the First International Symposium on "The Genetics of Cyanophytes", in April, 1973 at the Duquesne University, Pittsburgh, U.S.A.

Mr. Mukti Nath

BORN on April 18, 1917, Mr. Mukti Nath took his M.Sc. degree in Geology from the Banaras Hindu University in the year 1939. He remained on the staff of the University for some time teaching post-graduate classes, then joined the State of Sirmur as State Geologist. During his stay with the State he investigated, deposits of lead, pyrite, iron ore gypsum and limestone.

He joined the Geological Survey of India in the year 1941 and up to 1958 he worked in different parts of the country, carrying out regional geological mapping, detailed mapping on aerial photographs and large-scale mapping for various metallic and non-metallic minerals such as lead, copper, pyrite, antimony, bauxite, limestone, etc. In 1958 he was promoted to the rank of Director and was made incharge of the investigations in parts of Rajasthan.

He went to Nepal in 1961 as member Geology of the Indian Cooperation Mission. During his stay in Nepal up to 1963 he organised and directed the geological and mineral investigation work in that country specially for copper, cobalt, nickel and limestone.

Once again he returned to Rajasthan as Director incharge, Rajasthan Circle, where he remained up to 1969. During this period under his supervision some major mineral deposits were located which include the well-known Saladipura pyrite deposit and Dariba Rajpura lead zinc deposit. Under his guidance phosphorite deposits were discovered for the first time in the Precambrians of India, near Udaipur, Rajasthan, which opened new vista for the search of phosphorite in the country.

During 1970-71 he worked as Chief Geologist with the Hindustan Zinc Ltd., on deputation from Geological Survey of India. Here he organised the Geological department on modern lines and undertook detailed prospecting operations in the properties of the Company. In 1971 Mr. Nath was appointed as Deputy Director-General in the Geological Survey of India and was given the charge of the Central Region, with headquarters at Nagpur.

He has been to the U.S.A. on a study tour under the U.S. Aid Programme in 1960. He also represented India at the ECAFE Conference for Fertilizer Raw Materials in December, 1967 held at Bangkok.

In recognition of his distinguished contribution towards the discovery of Phosphorite deposits in Rajasthan, Mr. Mukti Nath was given the National Mineral Award for the year 1971.

At present he is on deputation from Geological Survey of India to the newly created Mineral Exploration Corporation Limited and its Chief Geologist.

Dr. L. S. Kothari

A SENIOR Professor in the Department of Physics and Astrophysics of the University of Delhi, Dr. L. S. Kothari had his school education at Vidya Bhawan, Udaipur (Rajasthan) and higher education at St. Stephen's College, University of Delhi. He took his Ph.D. degree from the University of Bombay.

On an Atomic Energy Commission scholarship he spent some time at the Universities of Cambridge and Oxford and at the French Atomic Energy Centre at Saclay. On return, he worked for about six years in the Theoretical Physics Division of the Atomic Energy Establishment, Trombay (now renamed BARC). He spent one year at the Department of Physics of the Panjab University and then joined Delhi University in 1963, where he is presently working.

Dr. Kothari's main contributions are in the field of neutron physics. He has also done work in various other fields including quantum electrodynamics and solid state physics. The work done by his group on neutron thermalization and diffusion in moderators is widely quoted not only in technical literature but also in text-books. They suggested new avenues along which much work has been done here and abroad.

He has published over 80 technical papers and has written about 10 general articles. He is co-author of two review papers, one of which was published in *Advances of Solid State Physics* Vol 8, and the other in *Advances of Nuclear Science and Technology* Vol 2 (Academic Press). He is also co-author of three books. One of these is on *Mathematical Recreations*. This has been written in Hindi in collaboration with Dr. O.P. Sharma and has been published by NCERT. He was also a member of one of the Physics Groups of NCERT and has helped in preparing text-books in Physics for schools.

Dr. Kothari is a Fellow of the Indian National Science Academy and a member of the Commission on Physics Education of the International Union of Pure and Applied Physics. He is the Chief Editor of *Journal of Physics Education*. He served as Recorder of the Physics Section of the Indian Science Congress in 1969 and 1970.

Prof. B. C. Haldar

NOTED for his pioneering work in the development of thermometric titration technique, Prof. B.C. Haldar, M.Sc., D. Phil. (Sc.), F.R.I.C., F.I. Nucl. E. (Lond.), has received international recognition for his contributions in the fields of Nuclear Chemistry, Coordination Chemistry and Analytical Chemistry.

Among his earlier achievements is the discovery of four radioisotopes Ag-103, Re-177, Re-178

and Re-180. His present research interest includes environmental studies with special reference to pollution of water and air. He has published 120 research papers in scientific journals of repute, which are frequently quoted in text books, reference books. In 1970, he received an international award of \$ 500.00 from the Walcott Gibbs Fund of the National Academy of Sciences, U.S.A. to support his research work. He is an eminent teacher and has taught at the Universities of Calcutta, Notre Dame, Rochester, Rangoon, Gujarat and Bombay. Twenty five students have received research degrees of different Universities under his guidance.

Prof. Haldar, who is now 50, was born in Calcutta and had his early education there in the Town School, Vidyasagar College and University College of Science and Technology. He was awarded the coveted Premchand Roychand Scholarship in 1948 and Palit Travelling, Smith-Mundt and Fulbright Fellowships in 1950. He did his post-doctoral studies at the Universities of California (Berkeley), Notre Dame and Rochester, U.S.A.

He is a member of a large number of scientific societies and of various committees of national and international importance. He has travelled widely and visited scientific and research laboratories in the United Kingdom as a guest of the British Council in London during October, 1968. He delivered one of the main lectures at the Conference on Improving International Cooperation, held in U.S.A. in 1972.

Before his present appointment as the Director of Education (Higher Education), Maharashtra State, he held the post of Director of the Institute of Science at Bombay (1970-72) and at Nagpur (1969-70). He was Professor of Inorganic Chemistry at the Institute of Science, Bombay (1960-69) and also at the Gujarat College, Ahmedabad (1956-60).

He is the Joint Secretary of the State High-Level Coordination Committee of Scientific and Technological Research and its Utilization, which acts as the *Think Tank* of the Government of



DR. T. V. AVADHANI
President,
Statistics Section



PROF. R. S. KUSHWAHA
President,
Mathematics Section

Maharashtra for the review of scientific and technological policies.

Prof. Avadhani

MACHILIPATNAM born (1925) Prof. T.V. Avadhani had his earlier education at the hands of his father, late Sri Ramaswami Sastry, a veteran teacher, and later in the Andhra University. He had a uniformly brilliant first class academic career throughout, winning several prizes and medals. Finally, he took the M.A. degree in Mathematics in 1946, with specialisation in Statistics. From 1946 he worked in a college till 1949 when he shifted to the Andhra University as a lecturer in Mathematics. He took to research in 1951 and obtained a Doctorate degree from the Andhra University in 1955 for his thesis entitled *Eigen Function Expansions*.

On a British Council fellowship, he left for U.K. during 1955-56 to work with Prof. M.S. Bartlett, F.R.S. on "Stochastic Processes" as a post-doctoral Research Scholar. The results of his research on 'Multi-dimensional stationary stochastic models' were later published. Under the exchange programme of the U.S. Education Foundation in India, he spent one year (1968-69) as a visiting professor at the University of California, Berkeley, and the University of Michigan, Ann Arbor. During this period, he also visited quite a number of well known Universities in the U.S. and gave lectures and seminars. On his way back, he spent about two months, visiting and lecturing at the Universities of London, Oxford, Cambridge, Manchester and Sheffield in U.K. and the Universities of Heidelberg, Erlangen, Amsterdam, Paris, Zurich and Rome in Europe.

His main fields of interest are Stochastic Processes, Non-parametric inference, Operations Research, Demography, and Design of Field Surveys. He has several research publications, papers, books and reports to his credit,

which are referred to by authors in their standard books and research papers and reports. His joint paper on 'Non-parametric inference in Stochastic processes' (1969) opened up a new branch of research.

In 1951 he shifted from the lectureship in the Mathematics Department to the newly started Statistics Department and later on became a Reader and Professor and at present is also the Head of the Department of Statistics in the Andhra University. As a teacher and researcher, he is held in high esteem.

From 1959-64 he also acquired considerable practical and field experience as the Honorary Deputy Director of the Socio-Economic Survey of the area of the Nagarjuna Sagar Project — a multi-purpose river valley project. Recently (in July 1972) he successfully conducted a survey on the Visakhapatnam City Transport and gave a very useful report.

Technical member of different committees of various Universities, research organisations, and the Government, he is currently a member of the State Level Committee on Science and Technology Policy of the Government of Andhra Pradesh.

Dr. Kushwaha

SPENDING his early years in the District of Agra in U.P., Dr. R.S. Kushwaha was lead to the University of Allahabad for higher education. He stood first in the M.Sc. examination in Mathematics and consequently was appointed on the staff of the Department of Mathematics in that University just after passing M.Sc. Thus he had the good fortune of joining the well known school of researchers in theoretical astrophysics which was initiated by the celebrated late Professors M.N. Saha and A.C. Banerji and which has produced several astrophysicists of repute who are now occupying important positions in India.

At this time Kushwaha came in contact with the most brilliant

product of that school, Dr. P.L. Bhatnagar, who initiated him to the researches in astrophysics in the true sense. From this active school Dr. Kushwaha obtained his D. Phil degree for his researches on Dynamical instability of stellar pulsations.

In 1956 he proceeded to join the group of astronomers at the Dominion Astrophysical Observatory at Victoria in Canada.

On return from there in 1958 he was appointed in the Department of Physics of Delhi University to organise with Dr. Ram Behari, Dr. D.S. Kothari and Prof. F.C. Auluck the astrophysical studies. In 1959 he was awarded U.P. Government's Education Ministers' Gold Medal by National Academy of Sciences India for his researches in Mathematics.

He moved to a new born University of Jodhpur in 1963 as Professor and Head of the Department of Mathematics. In 1964 he again went to U.S.A. This time as an alien scientist he joined an active group of researchers at space physics lab. in the plasma physics division in Air Force Cambridge Research lab at Bedford Mass. There he worked upto 1966 for the U.S. Air Force and earned a certificate of excellent performance.

Towards the end of 1966 Dr. Kushwaha returned to his position at Jodhpur University and in 1970 he was given the Senior scale of the Professorship, a position in which he is continuing at present.

He guided research students in several fields: Astronomy and Astrophysics, Instabilities Magnetohydrodynamics, Plasma Dynamics, Shock waves, Relativistic models of the universe, Application of Generalised Function, Meteorology.

Dr. Kushwaha is member of a number of professional bodies, societies and expert panels in the subject of Mathematics and Astronomy. He was elected President of Physical Section of National Academy of Science in 1972 and is at present General Secretary of National Academy of Sciences India.

Social and Educational Requirements of New Technology

DR. M. S. SWAMINATHAN, F.R.S.

FOR THE developing world, ecology has to be understood in a very different sense. Most people do not have even the bare necessities of life and therefore hardly any standard of living to conserve or to protect. Rapid economic growth is hence a prime necessity. Human wastes and civic effluents form a far greater source of pollution in the poor nations than scientific and industrial pollutants. Mrs. Indira Gandhi, made this point vivid at the United Nations Conference of Human Environment held last year in Stockholm, when she described poverty as the greatest pollutant. In our situation, knowledge of ecology should be regarded as an instrument of balanced and rapid economic growth.

What is needed, is a close and detailed understanding of local eco-systems, and its application to local situations by those who are fully informed of the parameters of the problem. If development is not to be destructive, then the developing countries must take responsibility for understanding their own ecological needs, resources and patterns and plan their development accordingly. Ecology has to be a positive force in the poor countries, one which supports the economic growth we so urgently need, and not just a conserving force. This can be achieved when the people of each area participate, through Block and District level land use and Crop Planning Forums, in the formulation of detailed land and water use plans for their areas. Land use planning at the Block level, assisted by guidelines on market needs and opportunities by a suitable authority at the State level agency, would alone result in a dynamic agriculture, where the profits of progress accrue to all sections of the community.

The emerging agricultural technology is of two major kinds with regard to the ease of adoption. In one kind, as for example, the new technology of wheat cultivation, the economic benefits derived by a farmer by adopting the technology are not influenced by what his neighbouring farmer does or does not do. In other words, the technology is capable of successful individual adoption in economic terms. In the other kind, the economic

benefits conferred by the technology on the farmer will be proportional to the extent of co-operative action generated on the part of an entire village or water-shed community.

Our political freedom depends on rapid economic growth and this in turn depends on our performance in agriculture. The future of our agriculture in its turn depends on the success with which we can help the small and illiterate farmers to take the many small steps which alone can lead to a great agriculture. Science can only show the way; it is for the educated and the privileged class, to provide the will.

Rice and cotton cultivation and prevention of disease epidemics in cattle are good examples. Even in the Punjab, with one of the finest farming communities in the world, the average yield of cotton is low, being only 368 kg/ha. In contrast, in the Arab Republic of Egypt where cotton cultivation is managed cooperatively without any infringement of individual ownership, the average yield is 780 kg/ha. Pest control and water management in rice are best done cooperatively in a village. In fact, if this can be accomplished, even some of the fertilizer lost through leaching in drainage water can be recycled, by collecting such water in a pond at the lowest point and re-distributing it. There is need for achieving a doubling in fertilizer response from the present low level of about 19 kg. of grain per kg. of NPK nutrients.

The emerging concept of pest avoidance is pest management and not just chemical control. All these aspects of the new technology would need understanding and cooperation among neighbouring

The author is Director-General of ICAR. The article is based on one of his Sardar Patel Memorial Lectures, delivered at India International Centre, New Delhi.

small farmers. If this is not achieved, the risk element in crop production will be high. A low-cost and low-effort agriculture will be the poor cultivator's response to a high-risk farming situation, unless he has protection by means such as crop insurance. This is an important reason for the relative stagnation of *kharif* crop production in our country, where in spite of moisture availability, the farmer hesitates to invest on inputs in areas which are prone to pests and diseases, water-logging and operational problems inland preparation.

Technical Skills

Cooperative effort is not only needed in the delta areas during the *kharif* season but even more importantly, in the dry farming regions. While an individual farmer can increase the storage of moisture in the soil profile of his own field through tillage, mulching and other measures, the possibilities for collecting all the run-off water and using it for a crop life-saving irrigation later, can be realised only if there is group action in accordance with the top-sequence of the farms.

Turning to the social and educational infrastructure which is a prerequisite for the successful adoption of the technology, I shall deal first with the educational aspect. What kind of education do we need that would be relevant to our society, dependent as it is on agriculture as its major activity? And what practical steps can we take to change our educational system into such a one?

The changes required are of two kinds: at one end, we need to bring about a change in outlook, creating an awareness of biological surroundings, and a consciousness of the possibilities of synergy. This can be done only when there is an inundation, so to speak, at every level of education, of materials that will create such a consciousness. At the other end, we need to give technical skills to illiterate and semi-literate adults, which will enable them to understand and use efficiently the new technological package. Between these two, there is a wide range of activities which can be applied at every educational level.

There have been other similar ventures, but all have remained small, local and isolated. At a different level, the Avinashilingam College of Home Science in Coimbatore for instance, has compiled a set of songs for pre-school children incorporating knowledge about nutrition. The ICAR and the Extension Directorate of the Union Ministry of Agriculture are shortly bringing out a publication which will be a collection of games for use in class rooms and in recreation introducing information and concepts about agriculture. They can be played both by the adults and children. The details of the games will, however, have to be developed in each Block using data applicable to that region. We need many more such educational games and kits that will make use of the play way idea of teaching science in general, and agriculture in particular.

A useful adaptation of the idea of work experience is to give academic recognition, through marks, to real economic work projects, self-chosen by students and carried out by them in their spare time, either alone, or with the help of their families. A boy or girl, who can run a simple project such as a poultry unit or a kitchen garden, would have learnt much by way of independence, responsibility and initiative, as well by way of arithmetic, science and economics. It is needless to add that the conventional literacy skills of reading, writing, and arithmetic will also be fully utilised in such projects. Of course, it means more time and effort on the part of teachers and administrators to identify and initiate such projects. Further, it requires the technical assistance of officials of agriculture departments and extension agencies. It is naturally much easier to provide artificial work in the class room and call it work experience than to help children to engage in real work and to assess it as it deserves. Children become responsible when they are obliged to carry responsibility.

At the university stage, fewer people are involved, but they need to be involved differently. Let me begin by quoting some facts. In 1969-70, about 3 million students were enrolled in higher education — 2½ million men and ½ million women. Of this, only 1.6 per cent of the men and 0.4 per cent of the women were engaged in any kind of agricultural studies. Only 176 women were enrolled in agricultural pursuits and living in the rural areas, it is sad that such a small fraction of men and women are engaged in studies which can contribute to rural development or agricultural productivity.

Practical Ways

It is specially sad that though women contribute equally to the labour force in agriculture, performing many of the key operations and most of the more tiresome ones, agriculture as a profession is not regarded as a suitable one for women at the higher stage of education. This reflects the gap between the educated classes, who are mostly drawn from the urban areas, and now-a-days also from the rural elites, and the rest of the population.

Apart from providing more opportunities for higher education and technical studies in agriculture, we have also to think of other practical ways in which the great majority of university students can be helped to become involved in the work of rural development and to acquire some understanding and sympathy for the problems of a greater part of this country's population. An example of how non-agricultural colleges can participate is the good farm run by the staff and students of the Madras Christian College, in what until 1965 was a scrub jungle.

Making work-experience an integral part of university education would help to generate a greater sense of self-confidence and self-reliance on the part of the student. One approach to achieving this aim may lie in making an in-built provision in each

one of our developmental projects for students' participation.

Every university student must be employed in an appropriate Plan Project for a period of two months every year, while he or she is in the University. A semester system of course-curriculum organisation would help in the implementation of this idea, although this is not absolutely essential. The summer vacation can be restricted to one month, so that the formal teaching programmes do not suffer.

The assignment of students to various projects will need proper planning and adequate consultation between the universities and Project authorities. Needless to say, the assignment of students will be based on the principle of learning through work and would hence involve a planned matching of the field of study with the field of work. Thus, students of History and Archaeology may work for the India Tourism Development Corporation; Zoology and Medicine in the family planning and preventive medicine programmes; Agriculture, Botany, Chemistry, Physics, Economics, Engineering and Home Economics in agricultural development and child nutrition programmes and nearly in all fields of pre-primary and secondary education programmes.

Specific Projects

All scientific institutions in the country run by Central and State Governments can provide opportunities for students to work in specific projects and can at the same time give a great fillip to the cottage industry movement by supplying detailed manufacturing drawings of new implements, machinery and processes. With these drawings, university students in engineering may be in a position to help village communities in starting small-scale industries, since rural credit is becoming more easily available now.

The ICAR is proposing to set up a number of Krishi Vigyan Kendras to impart technical literacy to practising farmers, fishermen and others. These Kendras would select in each area such means of economic growth which are most likely to give major benefits to the poorest sections of the community. In other words, those who are setting up a Krishi Vigyan Kendra will first have to make a survey of the agricultural potential of an area and then identify those aspects of growth which could help to improve the purchasing power of the poor. For example, in an exercise done in the Union Territories of Pondicherry and Karaikal, where Krishi Vigyan Kendra has been approved for establishment, it was found that the following areas needed immediate attention, if the poor are to be benefited:

(1) Improving the income and reducing the under-employment of over 10,000 fishermen.

(2) Improving the average per hectare rice yield to about 2,000 kg. as soon as possible from the existing 1,400 kg.

(3) Introducing a scientific animal husbandry programme in order to produce more milk both for marketing and for making milk powder.

A similar Krishi Vigyan Kendra in Punjab may deal with topics like tubewell technology, repair of implements and tractors and scientific multiple cropping.

Even if we are able to provide the educational infrastructure needed for agricultural reconstruction, we would still have to develop a social organisation which can help small farmers to overcome the limitations arising from the small size of farm holdings, lack of capacity to purchase the requisite inputs and inability to get a fair price for the produce. To achieve this aim we will have to devise strategies to generate social synergy.

Ruth Benedict, the anthropologist who first applied the concept of synergy in social sciences, says: "Societies where non-aggression is conspicuous have social orders in which the individual by the same act and at the same time serves his own advantage and that of the group... Non-aggression occurs in these societies, not because people are unselfish and put social obligations above personal desires, but because social arrangements make these two identical.

"Cultures with low social synergy are those in which the social structure provides for acts which are mutually opposed and counteractive, and cultures of high synergy where it provides for acts which are mutually reinforcing... In cultures with high social synergy, institutions ensure mutual advantage from their undertakings, while in societies with low social synergy the advantage of one individual becomes a victory over another, and the majority who are not victorious must shift as they can."

According to Abraham Maslow, "The high synergy society is the one in which virtue pays... High synergy societies all have techniques for working off humiliation, and the low synergy societies uniformly do not."

Far-reaching Changes

If slogans such as the transformation of rural life, or the achievement of growth with social justice are to be translated into reality, then the new technology must be such that it can be adopted by the small, poor and illiterate farmer. Do we have such a technology? Yes, but its adoption particularly during the south-west monsoon season requires a certain degree of co-operative effort and a changed outlook. These in turn imply far-reaching changes in education and social organisation as prerequisites.

Let me quote a few encouraging examples of what I mean!

Here and there in our countryside, but unfortunately only rarely, we see striking examples of the

economic benefit that can accrue to small cultivators by co-operative action. The Bhartiya Agro Industries Foundation at Urli Kanchan near Poona has sponsored a whole set of co-operative activities like lift irrigation, dairying, poultry and joint farming based on the concept of uplifting the rural poor through the latest agricultural and animal husbandry techniques. The work of the Kaira District Co-operative Milk Producers' Union, Anand, is too well known to need description.

Identification of Catalysts

The Archbishop of Trivandrum, for example, has personally tested and popularised new varieties of tapioca, hybrid napier grass and other strains on a large scale. Our Rashtrapati, Shri V. V. Giri, in his integrated scheme on land colonisation has given a detailed outline as to how the benefits of agricultural transformation can be transmitted to educated unemployed youth on the one hand and landless labour on the other. Such colonies could become centres of generation of social synergy. All these examples need to be multiplied as fast as possible. This can be done, provided at the village level there is a combination between those who possess technical knowledge and those who are devoted to social service and both together identify the most important need of the village in getting its economy moving. If the need is correctly identified, and then properly attended to, it will act as a catalyst in releasing synergy. An important task of social workers is hence the identification of catalysts which can bring home through tangible economic benefits the value of co-operation to the small and marginal farmers.

The technology is now becoming available but the mechanism for transferring it to the illiterate and small users in an effective manner does not exist. Ironically, there is a global communication network which makes the latest findings of science available almost immediately to research workers in any corner of the world; but what is urgently needed is such a communication network at the service of the poor farmer in our country. It is not only knowledge that is needed, but an approach which will be able to supply the right knowledge and tools to the right people at the right time and place. The worker on the spot, whether he is an agricultural officer, a teacher, a gram sevak or a social worker, must be able to identify the local problem or need which will act as a catalyst for promoting co-operative endeavour in that area—it may be lift irrigation in one place, dairying in another, pest control in a third, supply of farm machinery or fish fingerlings in a fourth and marketing in a fifth. In this network, the mass communication media, particularly the radio, television, cinema and the language press, have a very important role to play; so have the research and the extension worker, the education system and the drive for technical literacy. ●●

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NEW YEAR

Application of Science, Technology for Development

One of the tasks of UNACAST is to keep under review progress in the application of Science & Technology to development, & to propose practical measures for such application for the benefit of the developing countries. One of the measures has been the preparation of the World Plan of Action for Application of Science & Technology to development, which has now been incorporated in the United Nations Strategy in the Second Development Decade which began in 1971. The other measures have been the preparation by the UNACAST — with the help of other U. N. bodies — of the Regional Plans for Application of Science and Technology to development which are based on the development and priorities of Africa, Asia and the Far East, Latin America and certain countries of the Middle East.

THE NINETEENTH session of the U. N. Advisory Committee on the Application of Science and Technology to Development (UNACAST) opened at Palais des Nations, Geneva, on November 13. It concluded on November 20, 1973.

M. G. K. Menon (India) was the Chairman for the session. The Committee elected Mr. J. M. Gvishiani (USSR) and Mr. P. V. Auger (France) as Vice-Chairmen of the session and Mr. W. K. Chagula (Tanzania) Rapporteur.

The Advisory Committee was established by the U.N. Economic and Social Council in 1964 to give practical effect to the results of the United Nations Conference on Science and Technology, held the previous year in Geneva. It advises the U.N. on efforts to accelerate the application of science and technology to economic and social development in the developing countries. All its 24 members are experts serving in their personal capacities.

As its nineteenth session, the Committee discussed the future thrust of its activities, particularly in the light of two resolutions adopted by the Economic and Social Council.

The Economic and Social Council by a resolution requested the Secretary-General, after consultation, to report on ways in which the Advisory Committee could be strengthened.

The other resolution, which dealt with the role of modern science and technology in the development of nations, stated that the governmental Committee on Science and Technology for Development

should be the focal point for the elaboration and continuing evaluation and assessment of United Nations policy in the field of science and technology. It stressed the need for the Advisory Committee to cooperate with the Committee on Science and Technology for development in fulfilling its tasks. The Advisory Committee has now reaffirmed its belief that such close cooperation is essential. It strongly supported the view of the Council that the planning of activities in the field of science and technology in the various organisations of the United Nations system should be harmonized and gradually integrated into a United Nations science and technology policy.

The resolution also requested the Committee on Science and Technology for Development to examine the advisability of convening a second United Nations Conference on Science and Technology. The Advisory Committee was of the view that such a conference should be held within the next few years. Holding that the success of a second conference would depend on the preparatory work put into it, the Committee expressed its willingness to cooperate with the Committee on Science and Technology for Development in planning such a conference. It felt that the conference should be inter-governmental and should concern itself largely with practical measures to ensure the successful application of science and technology to development.

The Economic and Social Council has requested the Committee to provide an indicative list of possible new items for review and incorporation in the Plan of Action for the Application of Science and

Technology and to assist the Secretary-General in determining the most appropriate organization in the United Nations system to initiate action and implement the priority areas of the World and Regional Plans of Action.

During the session, it received reports on action taken to initiate regional plans of action and to stimulate progress. It recommended that the regional plans should be made available to the Committee on Science and Technology for Development at its next session.

Solar Energy

The Committee was informed that a request has been received from the Executive Director of the United Nations Environment Programme (UNEP) asking it to undertake a study, and report to UNEP, on non-conventional, non-polluting sources of energy for developing countries. The Committee had already become interested in the question of solar energy and its applications, and the European Regional Group had taken up in a preliminary way the question of non-conventional sources of energy.

During the meetings, a working group of the Committee prepared the draft of a pre-proposal for the preparation of the study requested by the UNEP. This draft was approved for transmission to the UNEP secretariat for formal submission to the second session of the Governing Council of UNEP in March 1974. If the Governing Council of UNEP approves the proposal, it is expected that resources would be made available for carrying out the study under the general direction of the Advisory Committee's Working Group on Problems of the Human Environment.

The study is proposed to be undertaken in close co-operation with the United Nations Division of Resources and Transport, the United Nations Educational Scientific and Cultural Organization (UNESCO), and other appropriate United Nations organs.

Recent scientific and technological developments are providing new possibilities for alternative sources of energy which would be less polluting and would also contribute towards solving the energy problems of developing countries, particularly for the supply of energy in remote and rural areas where at present, little or no energy is available. The Committee anticipated that the study will draw the attention of Governments to this progress and focus particularly on the following four sources of energy:

(a) Solar applications for providing small power energy;

(b) Biological energy conversions, such as use of algae, micro-organisms and bacteria, in conjunction with solar heat to produce hydrogen, methanol (synthetic natural gas), waste fermentation, etc;

(c) Wind energy—modern technology has provided significant improvements in the efficiency of

wind-propelled generators which make them particularly attractive for isolated areas in developing countries;

(d) Geothermal energy—focus will be placed on the development of medium-size geothermal sources available for several developing regions.

The study will also identify the areas where more research and development should be undertaken and funds appropriate to meet the energy needs for the remainder of this century.

The expectation is that the draft report will be submitted to the Committee for review at its 1975 session. The final report will go to the United Nations Environment Programme before the end of 1975 with recommendation.

The Committee earlier considered a proposal to establish a clearing house and sponsoring office for the promotion of research projects on problems of importance to developing countries. In the light of the decisions taken at the eighteenth session, a survey of the need for such a clearing-house was organized by the Office for Science and Technology among United Nations bodies, potential supporting organizations, a number of governments and other appropriate organisations. A wide range of views about the means by which such a proposal might be implemented were expressed, but there was general agreement on the need for such an organization.

The Office for Science and Technology, with the assistance of a consultant, subsequently prepared a report on the matter which was considered during the session at two meetings of an *ad hoc* working group. As a result, the proposals for the establishment of a clearing-house were redrafted. The Committee unanimously endorsed these proposals and asked its *ad hoc* working group to keep the matter under continuing review. It was agreed that the words Advisory Service for Sponsoring Research Proposals for Development gave more accurate description of the body proposed than the title "Clearing-house."

The Committee noted that a need had been felt for an informal non-governmental channel for bringing scientists who were formulating research proposals of value in solving development problems into contact with technical and financial resources available in other countries, both developed and developing.

In the nineteenth session, the Committee also considered items dealing with application of computer technology to development; establishment of a Special Protein Fund; technology for development; future United Nations conferences, and other matters.

According to a decision of the Economic and Social Council, the Committee is to hold only one session in 1974, from October 21 to November 1.

The term of office of the present membership of the Committee is to expire at the end of 1974. ●●

Chemistry in Engineering Education

JOSEPH C. KURIACOSE

THE EVOLUTION of the educational pattern can be considered under two periods. In the early days curricula were grouped around the study of classics — the purpose of education being cultural and its cultural value was measured in terms of its classical content. At a later period there grew up a feeling that such studies were not practical and that educational training should be along the lines of learning by doing, vocational activities and specialisation in the higher branches. In modern India one cannot overstate the importance that society places on job-oriented education.

Education has as its purpose the formation of a cultured person with the necessary training to be a useful member of society. Culture must take into account each individual's obligations to society and it must nurture the ability to enter sympathetically into the lives of others and their social problems whether economic, political, aesthetic or philosophical. Any part of an educational programme, to have a cultural value must develop not merely "an appetite for intellectual attainment and moral excellence" but must contribute definitely toward open mindedness, sincerity, an active interest in social betterment and a productive participation in all enterprises which have as their ultimate goal the uplift of humanity.

Every course apart from its practical value has a cultural value too. When considering the cultural value of a course one cannot be concerned with its content since culture is not inherent in the subject matter of any course. The deciding factors are determined by the method of approach, the purpose for which the subject is studied and the general attitude of mind which is carried away by the students themselves. Of course it is evident that some subjects lend themselves much more readily to cultural development than others, but it is easily imagined that any subject in the curriculum may be made cultural or not, depending on the sponsors of the course. Even the most practical professional subjects in engineering,

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science, law or medicine may become the vehicles of truly magnificent training in cultural aspects of life. It is true in no less measure that all subjects may lose their cultural significance entirely if the view-point is narrowed by selfish motives and the treatment of the subject is weighted down by mercenary objectives.

Chemistry offers a splendid opportunity to every teacher to bring into the classroom much of the elements of the culture of the classics. In addition, chemistry is an intensely practical subject, which presents useful information in a form which may be employed both in training the finer qualities of the mind and supplying the material for earning a livelihood.

One of the first mental reactions experienced by a novice as he takes up the study of chemistry is one of bewilderment. Perhaps the viewpoint is entirely new, the language different, the new terms confusing and the chemical symbols almost terrifying. It should not be hard to convince anyone in such a state of mind that chemistry furnishes an excellent opportunity for mental drill and memory training. As he proceeds he learns that accurate discrimination is essential. He learns that the distinction between

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mercurous chloride and mercuric chloride signifies the difference between a widely used and valuable medicine and one of our most common and virulent poisons; likewise in the preparation of a physiological salt solution the displacement of the decimal point may change a life-saving fluid into one sure to destroy life. His entire laboratory experience teaches an alert mental attitude, careful observations of the most minute details, and thoughtful, intelligent evaluation in the interpretation of results. Certainly here is a subject which demands of its students a carefully trained memory, ability to observe thoroughly and intelligently, power to distinguish between vital facts and non-essentials, and above all, the skill to interpret the significance of phenomena and to apply new knowledge to useful ends.

Chemistry, the science of changing forms of matter and the rationalisation of their interactions, can be related to the changes which characterise political, social and economic problems of the human race. Perhaps there is no more evident application of chemistry than that which applies to the age old struggle against the ravages of disease. The progress made in this battle forms a thrilling story of the new victo-

ries which we hope the future will win. It is not difficult to see that chemistry contributes its share toward world peace and economic security, these dual conditions now so earnestly desired. There is no area of human activity where the helpful hand of the chemist has not made its contribution and hence chemistry has become a powerful factor in human lives. We have been training specialists, looking at things from a professional angle and thinking so long in terms of "science for science's sake" that we are bewildered by the thought that chemistry is after all intensely human and has no small an influence on the happiness and lives of a large number of our fellows.

The engineering profession involves the practical application of physical, chemical and other scientific principles in large scale construction or operation of one type or the other. Many of the new products of chemical industries find applications in all fields of engineering. Their use is often dependent on their chemical behaviour more than on their physical properties. The usefulness of the understanding of elementary principles of chemistry in preparation for the engineering profession cannot therefore be denied.

Chemical Products

With each successive year, the role of chemistry and chemical products in every branch of engineering is greatly enlarged. Every advance, for example, in automotive engineering either produces a new chemical demand or awaits chemical developments for its introduction. For real progress in aircraft, the chemist and engineer are inseparable. The aeronautical engineer must know something of the chemical properties of the new materials provided by the chemist. The highway engineer has to work more and more with chemical materials. He uses his knowledge of colloid chemistry to create conditions for soil stabilisation. He has a choice of materials provided by the chemist for every aspect of his activity.

Take the case of the sanitary engineer who has to deal with the treatment and care of air, sewage, water and food supplies. Ventillation which means more than just the supply of fresh air from out of doors includes filtering of that air. For anyone dealing with this matter, a knowledge of materials natural or artificially produced, which will serve as filtering media without too greatly retarding air flow will be an asset. The treatment of sewage and water is not possible without an understanding of surface phenomena.

Consider a civil engineer who knows that copper is resistant to corrosion and so chooses it for eaves, troughs and downdrains but supports the copper eaves and troughs with iron brackets, only to see in a few years that the brackets have given way and the expensive troughs are hanging loose. Construction engineers are constantly dealing with the problem of corrosion of materials and the means to prevent it or protect surfaces against it. Elementary ideas of electrochemistry and a knowledge of the properties of paints and other coatings will be valuable assets for engineers who will have to tackle these problems. The engineer has to deal with metals and special al-

loys which have specific uses. A knowledge of the principles or rationale of the manner of formation and consequent properties of these alloys will be of considerable help to him in using these in the right place with the right effect.

Alternative Materials

The selection of the proper metal, alloy, or combination of metals, the best oil for a certain job, the correct plastic or textile for a particular set of conditions, or the best type of synthetic rubber for a given purpose is made possible by considering the chemical properties of the material more than the physical properties. The engineering graduate who knows the differences in chemical properties of alternative materials and who understands the general chemical principles on which their general behaviour depends will prove a better engineer than one who does not.

All earlier history had been determined by the fact that the capacity of man had always been limited to his own strength and that of the men and animals he could control. But beginning with the nineteenth century, the situation had changed. His capacity is no longer so limited; man had now learned to manufacture power and with it a new epoch began. In this space age, fuels for power generation has assumed considerable importance. None will deny the contribution a knowledge of the chemistry of these materials can make to the economic and efficient use of these materials by all engineers who have to deal with problems of generating power.

The strength of materials, the chemical composition of substances and the laws of heat and dynamic energy enter into almost every operation of modern life. Obviously the engineer must have a certain minimum training in chemistry, to prepare him for the profession, and as much more to serve him collaterally as his ambition towards success prompts.

The word technology stems from two greek words 'technos' (meaning art or a trade) and 'logos' (meaning a science). Thus, literally, technology is the science of a trade. Technology in general is the science dealing with methods and processes for converting products of nature into items of consumption and tools of production. All the branches of technology excepting chemical technology broadly speaking are concerned with processes which as a rule do not change the composition and inner structure of the material. However, no sharp dividing line can be drawn between chemical technology and the rest. In some cases the changes made in the shape and appearance of materials are accompanied by chemical reactions and chemical reactions in turn by mechanical processes. A technological education can therefore not be sound if one made abstraction of the sources and foundations that make technology possible.

Modern civilisation owes much to chemistry and chemical industry. They play a vital role in the economic development and technological progress of a country. Chemistry today is striving and has succeeded to a very great extent to prepare substitutes for

practically all the naturally available materials, that have been put to use. A recognition of the importance of chemistry has prompted the curriculum planners for technical education in this country to place a welcome emphasis on the inclusion of a good quantum of chemistry in the undergraduate curricula of the engineering degree courses.

Those who plan the engineering curricula only can provide the time for teaching of chemistry. The content of the course has to be formulated by the chemists themselves and it is obvious that the course is not to be planned to make a chemist out of the student but an engineer aware of the potentialities and methodology of chemistry. The purpose of the course should be to introduce the student to the discipline of this particular branch of science and to familiarise him with the principles and techniques that will make him more competent later on to discern in which direction the solutions should be sought for the problems they may encounter and also to estimate how readily the solutions may be forthcoming.

Fundamental Disciplines

Hardly had we begun to assimilate the effect of widespread use of the lighter metals and synthetic plastics developed before the war, than we were faced with new developments: microwave physics had a revolutionary impact on communications; antibiotics and synthetic pesticides produced an equally dramatic impact on sanitation and health; jet propulsion changed the logistics of transportation and weaponry; nuclear physics transformed concepts of energy resources and military power; and computer technology is revolutionising nearly every aspect of our lives. Life on earth appears not to be sufficiently complex for some of us; we are reaching out to the moon and stars.

The lead time between new discoveries in our research laboratories and their exploitation in technology has become so short that no technologically oriented curriculum can remain vitally useful to the graduates for a significant period. Progressive engineering schools have begun to emphasise studies of the fundamental disciplines in depth, in as much as the old divisions are no longer applicable to the contemporary world.

Since World War II, engineering schools have responded to the challenge of the current technological explosion in a variety of ways. Some have retained the classical pattern, while few have adopted core programmes with some specialisation, offering at the undergraduate level an unspecialised bachelor's degree in engineering. Other schools have organised more and more branches of engineering offering as many as 14 or 15 different degrees.

Practically all engineering students, of whatever persuasion, are now required to take one or more courses in "materials science." This essentially new subject consists of the theoretical principles underlying the structure and properties of matter, particularly in the condensed states. Some schools continue to offer as well a traditional course in materials testing, but many have abandoned this basically

empirical subject in favour of a more sophisticated approach, using the full resources of modern physical and chemical theory.

Pattern of Foundation Course

One may like to consider the following pattern for a foundation course in chemistry for the engineering students.

- Structure of matter, radio-activity binding and chemical constitution.
- Conservation of energy.
- The gaseous state and the kinetic theory of gases.
- The liquid state and properties of solutions.
- The solid state, magnetic and electrical properties.
- Thermochemistry.
- The second law of thermodynamics and equilibrium.
- Phase equilibria.
- Principles of metallurgy and alloy formation.
- Rate Processes.
- Electrochemistry.
- Elementary organic chemistry; nomenclature, functional groups isomerism, reactions.
- Environmental effects on materials.
- Fuels.
- Petrochemicals.
- Polymers, paints and varnishes.
- Water and its treatment.

The topic titles indicated above will derive their relevance to engineering education from the manner in which the substance of the lectures is planned. It has to be constantly borne in mind that the course is to be taught not to make a chemist out of the student but to provide him with the background to become a more effective engineer.

Parallel to the theoretical course a laboratory programme may be organised along the following lines:

- An exercise in qualitative analysis to introduce the student to the methodology and to illustrate the various principles that have been taught and their application in the solution of practical problems.
- Study of an equilibrium process.
- Establishment of phase diagrams using various techniques.
- An experiment in thermochemistry.
- Study of a rate process.
- Application of the principles of electrochemistry in the study of corrosion problems.
- An inorganic preparation and the study of the modification of the properties of compounds in a controlled manner.

- An organic preparation and the practical application of the compound thus prepared.
- Application of the properties of solutions.
- One or two applications of quantitative methods of analysis to demonstrate the technique.
- An experiment involving the use of radioactive tracers.
- An illustration of surface phenomena, adsorption and catalysis.

Although a great deal of information is often presented in a lecture, only a reasonable return should be expected on examinations, and the students should be encouraged to regard some of the additional material as background for future advanced courses. Some portions of the lecture material should be used to illustrate the type of science which is professionally and culturally exciting, because of the elegance of the logic, the rigor with which the physical concepts are treated, or conversely, cleverness with which useful approximations, empiricism or intuition have been used where rigorous formalism would contribute little to an understanding of fundamental principles or experimental observations.

Occasionally, a lecturer may make a presentation based on an oversimplified model and thereby obtain results which are only partially valid. In such instances, the inadequacies of the treatment and the limitations of the results must be pointed out in the lecture session in an attempt to improve the students' power to reason logically and their ability to detect errors or fallacies.

For example, many must have experienced the situation where a student only too often recalls that the internal energy E is independent of the volume V but fails to recall the restriction to ideal gases. Similarly the student remembers that ΔH is the heat absorbed at constant pressure without also remembering that this is true only for closed systems involving pressure-volume work alone.

Engineering is concerned with the exploitation of scientific knowledge to accomplish specific objectives like the building of bridges, the launching of rockets and the manufacturing of drugs. The present explosion of scientific knowledge has greatly enlarged the variety of applications which the practicing engineer will be called upon to make. His education must be broadly based so that he is prepared to meet opportunities that are now in the offing. Chemistry can contribute much to his understanding of what chemists have been doing, particularly in the area of correlating the physical behaviour of materials with their chemical compositions and structures. In turn, familiarity with the engineers use of chemical principles can help the chemistry instructor enrich the content of his courses.

The article incorporates the main substance of the paper presented by the author at the International Seminar on Study Service Activities held at Jakarta, Indonesia. Acknowledgements are due to the sponsors of the seminar.

Short Term Course

THE RECOGNITION of the importance of Chemistry in Engineering Curriculum has prompted the curriculum planners for technical education in this country to place emphasis on the inclusion of a good quantum of chemistry in the undergraduate curricula of the Engineering degree courses. The content of such a course should be so formulated as to make the future Engineer aware of the potentialities and methodology of chemistry rather than to make a chemist out of the student.

Such a course should inculcate in the student an appreciation of the discipline of this branch of science and should familiarise him with the principles and techniques that will enable him to be more competent later on to discern in which direction solutions to problems should be sought for and also to estimate how readily the solutions may be forthcoming. The short term course was planned to facilitate the sharing of ideas and experiences among teachers who are teaching chemistry to the undergraduate students of the Engineering Colleges, in an attempt to formulate a chemistry programme for the engineering student, which will be faithful to the discipline and also meaningful and purposeful for the student from the point of view of his professional career.

One may consider the following pattern for a foundation course in chemistry for the engineering students.

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- Conservation of energy.
- The gaseous state and the kinetic theory of gasses.
- The liquid state and properties of solutions.
- The solid state, magnetic and electrical properties.
- Thermochemistry.
- The second law of thermodynamics and equilibrium.
- Phase equilibria.
- Principles of metallurgy and alloy formation.
- Rate Processes.
- Electrochemistry.
- Elementary organic chemistry; nomenclature, functional groups, isomerism, types of reactions.
- Environmental effects on materials.
- Fuels
- Petrochemicals.
- Polymers, paints and varnishes.
- Water and its treatment.

The topic titles as indicated will derive their relevance to engineering education from the manner in which the substance of the lectures is planned. It has to be constantly borne in mind that the course is to be taught not to make a chemist out of the student but to provide him with the background to become a more effective engineer.

Parallel to the theoretical course a laboratory programme may be organised along the following lines:

- An exercise in qualitative analysis to introduce the student to the methodology and to illustrate the various principles that have been taught and their application in the solution of practical problems.
- Study of an equilibrium process.
- Establishment of phase diagrams using various techniques.
- An experiment in thermochemistry
- Study of a rate process.
- Application of the principles of electrochemistry in the study of corrosion problems.
- An inorganic preparation and the study of the modification of the properties of compounds in a controlled manner.
- An organic preparation and the practical application of the compound thus prepared.
- Application of the properties of solutions.
- One or two applications of quantitative methods of analysis to demonstrate the technique.
- An experiment involving the use of radioactive tracers.
- An illustration of surface phenomena, adsorption and catalysis.

The participants of the short term course in Chemistry in Engineering Curriculum offered by the Department of Chemistry under the Q.I.P. had frank discussions regarding the present curriculum in June and a summary of the discussion is given below:

The topics of discussion could be broadly divided into the following four categories:

I. SYLLABUS

The syllabus should be more precisely defined even at the risk of expansion, so that the teacher knows what exactly to teach and up to what level he can teach. There should be a revision of the syllabus at least once in three years and prior to revision and enforcement of the syllabus, copies must be sent to all the concerned colleges and due consideration should be given to the suggestions from the teachers, who are actually engaged in teaching the subject. Besides frequent seminars and discussions on the syllabus, if possible, a uniform syllabus may be adopted throughout the country. The stress should be on modern developments such as semi-conductors, prevention of pollution, fuel cells, rocket fuels etc. The topics should have an industrial bias with special reference to industries in India. Most of the fundamental aspects may be covered in PUC/HSc classes so that more time will be available to deal with advanced topics.

II. EXAMS AND PAPER SETTING

Examination, preferably of the semester type, to assess the students' performance is very essential. The question paper should be of an objective type with a view to test the students' ability to apply his knowledge rather than to test his memory. Open-book examinations may be encouraged. A system of continuous assessment and the grades should be considered for awarding classes. Question paper setting can be used as a powerful instrument in updating the syllabus and the teaching. Teachers who get an opportunity to set papers for university examinations should put into practice their ideas of the types of questions that should be set. This has been done in some places and has had a very salutary effect.

III. LABORATORY PROGRAMME

A coordinated lecture-cum-practical work is very essential for a proper understanding of the chemical principles. In the first year, the stress should be on learning the fundamentals and in subsequent years the practical work should be relevant to their professional interests. These experiments should be chosen in consultation with colleagues from the various branches of engineering. Analysis of materials that engineers are likely to come across, rather than the classical methods of analysis should be included. The students should be introduced to instrumental methods of analysis. They should be instructed in the techniques of analysis of less familiar but industrially important elements such as Ti, Mo, V, W, etc. There should be a *viva voce* not only during each practical session but also in the practical examinations. These go a long way in helping the student to face the interviews with greater confidence.

IV. TEACHING METHODS

The teacher should keep himself well-informed about the modern developments. The frequent use of teaching aids such as models, demonstration experiments, film shows etc., will make the lectures more popular and interesting. Refresher courses may be arranged for the teachers at least once in two years so as to make them aware of the recent developments. There should be effective communication between the chemistry teachers of the various engineering colleges by way of seminars and summer schools where discussions and exchange of ideas about the syllabi, teaching methods and other problems should be encouraged. Assessment of lectures by students be obtained by requesting them to fill in questionnaires. These response sheets should form the basis for self-improvement. ●●

NEW VACCINE AGAINST INFLUENZA

THE IDEA of seeking protection from influenza in vaccination was conceived four decades ago, when the virus causing the disease was finally "nailed down." Since then dozens of vaccines have been developed and tried, the number of sceptics increasing in proportion to the attempts to subdue influenza by vaccination.

Majority of doctors are of the view that flu vaccine not only does not protect all those who are covered but that it causes flu in a wild form among two out of a hundred vaccinated, which on a global scale will mean thousands of cases. Supporters of vaccine claim that the vaccine can protect every second person while according to economists even a 10 per cent reduction in incidence can justify the expenses on research and organisational measures.

But why are influenza vaccines less effective and reliable than those used against small-pox, poliomyelitis and many other grave diseases? There are several reasons and the most important being the influenza virus which is highly mutable and appears in a new guise in every new epidemic.

To produce a vaccine, the scientists have to isolate the pathogen of the new epidemic and then "tame" it, so that it can deceive the organism, as it were, causing it to muster its defences, but without actually provoking the disease. The process of "taming" is lengthy and complex, and so scientists just kill the virus and make prophylactic preparations out of it. Soviet researchers preferred to obtain vaccines from live viruses. These were introduced into a chicken embryo, then transferred to another egg, a second, a third, and so on. Fifteen, twenty and sometimes thirty changes were needed to deprive the virus of its pathogenicity. This vaccine was tried out on volunteers (most often workers of the laboratory themselves) and then on a limited group of the population. By the time the vaccine was ready for mass use it often happened that another strain of the virus and not the one against which the vaccine was effective was running amock all over the globe.

New Method of Cultivation

How were they to keep up with the virus's metamorphoses? A team of researchers at the Moscow Institute of Viral Preparations headed by Doctor of Medical Sciences, A. Alexeyeva proposed a new method of cultivating the virus — not in a chicken embryo but in a tissue culture medium, in special flasks. The scientists place kidney cells of chicken embryos in this culture medium, infect them with the virus and, once it has multiplied, transfer it to another flask with the same culture medium and chicken cells. Another few transfers, and the virus loses its

E. GORBUNOVA

aggressive properties, and after a few more the scientists have at their disposal a so-called stable strain, viral variant suitable for making a vaccine.

Actually speaking, this "tamed virus" is vaccine. To start mass production, it is only necessary to "accumulate" large quantities of the virus. The new method makes it possible to grow thousands of millions of viral particles on four chicken embryos and turn them into vaccine — all within one day.

In tissue culture medium the virus is "tamed" much more quickly. Two and a half to three months is enough to obtain a vaccine strain. It means that having isolated the new pathogenic strain of the incipient epidemic (this is usually done in summer) the scientists have enough time to prepare for the dangerous winter season.

The new method not only saves time but it has been established that the pathogen grown in tissue culture medium is also milder in character than the one cultivated in the chicken embryo. So the new, tissue vaccine causes no side-effects and never provokes the disease it is supposed to protect man against.

Safe and Easy to Administer

The effect of vaccination largely depends on its scope. Formerly vaccination was counter-indicative to the most vulnerable section of the population, the children. As for tissue vaccine, it is harmless even for one-year-olds.

The vaccine is produced in powder form. In special drum-shaped chambers the culture medium where the viruses multiply is dehydrated and turned into a powder. It can be preserved for a year without losing its properties. Before use the powder is dissolved in ordinary water. The vaccine is administered orally, which is another distinctive feature. Formerly vaccination was performed either subcutaneously or by inhalation through the nose, which made control over the quantity administered quite difficult. This vaccine is swallowed, and one teaspoonful of the reddish nice-tasting solution is enough to produce immunity in a man.

The tissue vaccine can also be used for the treatment of influenza. It causes the organism to produce interferon, a protein which represses multiplication of the virus. This probably accounts for the vaccine's effect of preventing complications, first and foremost the development of pneumonia, which becomes a grave danger during influenza epidemics and take a toll of hundreds of human lives. ●●

Rigid Procedures Hinder Accomplishments—Ahmed

“THE PROGRESS of our research and education programmes carried out through 19 agricultural universities and 24 ICAR research institutes, 77 all-India coordinated research projects and a very large number of *ad hoc* research schemes supported from cess funds has been very satisfactory during the last year, in spite of the fact that a large number of posts at various levels had to remain vacant pending the development of new recruitment procedures,” said the Union Agriculture Minister, Mr. Fakhruddin Ali Ahmed while addressing the annual general meeting of the Indian Council of Agricultural Research (ICAR) in New Delhi.

Later at a function Mr. Ahmed presented the Rafi Ahmed Kidwai Memorial Prizes to 10 agricultural scientists and research workers for the biennium 1966-67. The awards, carry a cash prize of Rs. 10,000 each.

He also presented the Jawaharlal Nehru Awards, instituted by the ICAR in 1969, to provide incentive to post-graduate students of agriculture to carry out research work of a high order. The value of the Award is Rs. 5,000 in cash and a medal, each.

Referring to some of the suggestions made by the Working Group on Agricultural Research, Education and Manpower Planning, he said that so as to make the existing agricultural universities really agents of change of our rural economy, it is proposed to strengthen them further.

The all-India co-ordinated research projects have to be strengthened in a manner that some of the neglected areas and problems receive proper attention. A detailed exercise has been done in the ICAR on the research support available in various parts of the country, and some major gaps have been identified. Programmes have been developed for Andamans, Lakshadweep and for areas like Goa. Detailed programmes for the Chhotanagpur and Santhal Parganas areas of Bihar, the *diara* lands of Bihar and Uttar Pradesh, the cold desert of Ladakh, and similar neglected or problem-soil areas are being worked out. The needs for crop-life-saving research in drought-prone areas were discussed in an international seminar organized with the financial help of the International Development Research Centre of Canada.

All the major problems of Indian agriculture were also discussed at a national seminar held in connection with the 25th Javanti of our Independence. One of the major difficulties which come in the way of translating ideas and plans into field accomplishments, Mr. Ahmed felt, is the rigidity of our present salary and other procedures which come in the way of recruiting good scientists and posting them in these difficult places. In addition to all-India co-ordinated projects, it is planned to organize a series of co-ordinated programmes on the lines suggested by the National Commission on Agriculture. This will help get the benefits of all scientific talent, wherever available within the country, in solving complex scientific problems.

He wished to so strengthen the existing ICAR research institutes so that the per capita productivity of the scientists is greatly enhanced. Only two new institutes are proposed to be set up during the next few years—one dealing with cotton to be located at Nagpur and another on agricultural engineering and post-harvest technology, at a location yet to be decided.

The existing Division of Plant Introduction at the Indian Agricultural Research Institute (IARI) is to be upgraded to a National Bureau of Plant Introduction and Exploration. Mr. Ahmed hoped that this National Bureau would also serve as an international genetic resource centre under the project for the setting up of a global network of plant genetic resources centres sponsored by the Consultative Group for International Agricultural Research.

The procedures for the sanction of *ad hoc* research schemes are to be streamlined so that worthwhile projects receive appropriate support at the appropriate time. This has become particularly important, he said, following the stoppage of PL-480 funds for *ad hoc* research projects in our universities and research institutions.

It is proposed to test and adapt new experimental finding techniques in agriculture, animal husbandry and fisheries on a whole village or water-shed basis through operational research projects. These projects will have the following major aims:

—To test, adapt and demonstrate the new agri-

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T	2	9	16	23	30	T		6	13	20	27	T		6	13	20	27
F	3	10	17	24	31	F		7	14	21	28	F		7	14	21	28
S	4	11	18	25		S	1	8	15	22		S	1	8	15	22	29

APR						MAY						JUNE					
S		6	13	20	27	S		4	11	18	25	S	1	8	15	22	29
M		7	14	21	28	M		5	12	19	26	M	2	9	16	23	30
T	1	8	15	22	29	T		6	13	20	27	T	3	10	17	24	
W	2	9	16	23	30	W		7	14	21	28	W	4	11	18	25	
T	3	10	17	24		T	1	8	15	22	29	T	5	12	19	26	
F	4	11	18	25		F	2	9	16	23	30	F	6	13	20	27	
S	5	12	19	26		S	3	10	17	24	31	S	7	14	21	28	

IUB HOLIDAYS—1974

Id-ul-Zuha (Bakrid)	5th Jan.	Guru Nanak's		Ed-e Millad	6th April
Republic Day	26th Jan.	Birthday	29th Nov.	Valsakhi	13th April
Mahasivaratri	20th Feb.	Christmas Day	25th Dec.	Rakhi Bandhan & Hazrat	
Holi	8th March			All's Birthday	3rd Aug.
Ramanavami	1st April			Vinayaka Chaturthi	21st Aug.
Mahavir Jayanti	4th April			Onam	30th Aug.
Good Friday	12th April			Jamat-ul-Vida	11th Oct.
Buddha Purnima	6th May			Dussehra	23rd Oct.
Independence Day	15th Aug.			Maharishi Valmiki's	
Mahatma Gandhi's				Birthday	30th Oct.
Birthday	2nd Oct.			Govardhana Puja	14th Nov.
Id-ul-Fitr	16th Oct.			Bhai Duj	15th Nov.
Dussehra	24th & 25th Oct.			Guru Tegh Bahadur's	
Diwali	13th Nov.			Martyrdom Day	18th Dec.

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(Continued from Page 25)

cultural technology on farmers' fields, for the purpose of which a cluster of 3 or 4 villages or a watershed area would be selected;

—To calculate critically the profitability of the new technology of food production;

—To identify socio-economic bottlenecks in the transfer of new technology;

—To assess the credit-worthiness of new agricultural technology.

These will be implemented jointly by agricultural scientists and social scientists. If properly implemented, Mr. Ahmed pointed out, they will help prepare reliable estimates of the cost-benefit effects of new technology, the credit needs for adoption of new technology and, finally, the risk factors involved which could be of assistance in estimating the feasibility of crop insurance.

On this occasion of the annual general meeting,

Mr. Fakhruddin said we have the privilege of recognizing the work of some of our dedicated scientists and young research scholars. Congratulating all the recipients of the Rafi Ahmed Kidwai Prize he expressed the hope that they would help make the late Rafi Sahib's "dream of prosperous agriculture come true."

He also congratulated the winners of the Jawaharlal Nehru Award for outstanding post-graduate students' research.

Mr. Fakhruddin expressed appreciation of the work done by the late Dr. S. S. Bains of the IARI, who pioneered a programme of research on multiple and relay cropping.

Dr. Bains unfortunately passed away at a young age due to an attack of rabies. The ICAR has decided to present Rs. 25,000 to the family of late Dr. Bains as a token of appreciation of the valuable contributions made by the late scientist.

Recipients of Kidwai Prize

Dr. T. N. Ananthakrishnan is incharge of the Entomology Research Unit located at Loyala College, Madras. For a period of more than 25 years he was engaged on studies concerning various aspects of *Thysanoptera*, a group of insects of considerable economic importance in this country. His study also included the biology and ecology of gall thrips (*Thysanopteroecidia*), mycophagous or fungus-feeding thrips with emphasis on the patterns of intra-specific diversity in thrips population, reproduction ability of thrips and the role of amino-acids in relation to the degree of susceptibility, tolerance and resistance of plants to thrips' attacks.

Dr. R. D. Asana was till recently the Head of the Division of Plant Physiology at the Indian Agricultural Research Institute, New Delhi, and is currently an Emeritus Scientist of the Indian Council of Agricultural Research, and Principal Investigator in Physiology in the All-India Co-ordinated Cotton Improvement Project. His researches led to the evolving of a wheat indeotype suitable for *barani* cultivation.

Dr. Narayan Ganesh Dastane is currently working as a Consultant with the FAO for the Lake Nasser Development Centre, Aswan, UAR. He worked on water management problems during the last 24 years at IARI New Delhi.

Dr. H. K. Jain is currently a Jawaharlal Nehru Fellow. He has developed an active school of research in the field of mutagenesis and cytogenetics at IARI and had followed the objective of stabilizing and improving upon

the gains already made in crops like wheat through the development of high-yielding varieties in other crop plants.

Dr. R. Krishnamourthy is now Cotton Breeder under the All-India Co-ordinated Cotton Improvement Project at the Indian Agricultural Research Institute, Regional Research Station, Coimbatore. His researches include a dynamic cotton breeding programme for the development of short-duration, compact plant-type varieties, extra-long-staple Egyptian type of cotton suitable for replacing imported varieties and gossypol-free lines of cotton.

Dr. Sohan Singh Prihar is Professor of Soil Physics in the Department of Soils, Punjab Agricultural University, Ludhiana, Punjab. He has made important contributions to our knowledge of soil and water management.

Dr. S. P. Raychaudhuri is the Head of the Division of Mycology and Plant Pathology at the Indian Agricultural Research Institute, New Delhi. After his early work on fungal diseases, he had taken up studies relating to plant virus and virus diseases in which many new lines of research have been developed under his guidance at the IARI, New Delhi. An outstanding work has been the control of zinc deficiency in guava trees which was threatening the guava industry in Rajasthan. Purification and crystallization of sunnhemposaic virus was done by Dr. Raychaudhuri for the first time in India.

Dr. Arvind Roy an internationally known Animal Physiology scientist, formerly Director, Central Sheep and Wool Research Institute, Avikanagar (Rajasthan), is well known for his work on the physiology of endocrine glands, hormonal control of metabolism,



Rafi Ahmed Kidwai Memorial Prize winners (first row, from Left): Dr. V. Santhanam, Dr. R. D. Asana, Dr. T. N. Ananthakrishnan, Mr. R. Krishnamourthy and Dr. S. P. Raychaudhuri. Jawaharlal Nehru Award winners: (second row): Dr. Vidhyasekaran, Dr. K. D. Singh, Dr. Masillamony, Dr. (Mrs.) Tara Mohan.

physiology of lactation and reproduction of farm animals. His outstanding researches in the field of reproductive physiology of buffaloes are seasonal breeders. The seasonality of breeding in buffalo cows is due to the influence of environment, management and nutrition of these animals.

Dr. V. Santhanam is an outstanding cotton breeder of the country. He is now the Project Co-ordinator of the All-India Coordinated Cotton Improvement Project. He was instrumental in introducing the concept of a plant type and quick maturity in the cotton breeding programme for off-season cotton cultivation in rice fallows and also distributed early-generation hybrid material to several Research Centres in the country. One of his significant contributions is the development of extra-long-staple Egyptian type of cotton suitable for import substitution which has long defied acclimatization under conditions.

Dr. A. Sreenivasan is at present an Emeritus Scientist at the Bhabha Atomic Research Centre, Bombay, and Adviser to the Dept. of Atomic Energy, New Delhi. He has made significant contributions to the promotion of various programmes for radiation preservation of foods.

Winners of Nehru Awards

THE FOUR postgraduate students in Agriculture and Animal Sciences, who got the Jawaharlal Nehru Awards (1972) are:

Dr. (Mrs) S. Tara Mohan (Genetics and Plant Breeding). She did her research in the Division of Genetics, IARI, New Delhi, under the guidance of Dr. H. K. Jain, Head of the Genetics Division, IARI, New Delhi,

Dr. K. D. Singh (Soil Science and Agricultural Chemistry). He did his research in the Division of Soil Science and Agricultural Chemistry, IARI, New Delhi, under the guidance of Dr. B. Ramamoorthy, formerly the Head of the Soil Science and Agricultural Chemistry Division of IARI, New Delhi.

Dr. P. Vidhyasekaran (Plant Physiology). He did his research at the Tamilnadu Agricultural University, Coimbatore, under the guidance of Dr. P. Narayanaswami, Associate Professor in Plant Pathology, Tamilnadu Agricultural University, Coimbatore.

Dr. P. Richard Masillamony (Veterinary Microbiology). He did his research in the Dept. of Microbiology, Christian Medical College, Vellore, under the guidance of Dr. Ruth M. Myers, formerly Professor of Microbiology, Christian Medical College, Vellore.

Varsity and Industry in U.K.

J. A. POPE

THE TRADITIONAL aims of universities and industry are very different. One is idea-oriented, involved in the pursuit of knowledge that may or may not contribute to the immediate well being of the world. The other is product-oriented, organised to run economically and to serve an immediate market. Their priorities could be described as complete opposites.

Why then are so many universities today concerned about establishing links with industry?

The short answer is that the traditional role of both is no longer so clear. For centuries universities have been dedicated to producing experts. And for the last century industry has been equally dedicated to mass producing products to meet the demands of the consumer economy.

The scale of activities in science and technology is now so great that neither the universities nor industry can afford to be quite so single minded any more.

Complementary Aims

It could well be that the aims of a technological university and the industrial activities that surround it are complementary. Through its research activities, a university may be involved in problem solving. In industry the constraints that society imposes on production, may create problems: if you are not allowed to pollute a local river, what do you do with your toxic waste?

Industry in UK is being asked to accept its social responsibility and often calls upon the universities in the role of consultants to help solve many of the problems.

For some years most technological universities have been gradually establishing links with local industry, sometimes informally, sometimes for particular help. In the University of Aston, cooperation between the universities and industry and commerce is an urgent topic and we have therefore set up a small non-profit making company, Aston Services Ltd, which we are hoping will create a useful link.

It is wrong to think such cooperation is a natural partnership with a mutual affinity and that if you just sit back and relax it will all happen naturally.

There are many ways a suitable organisation can be achieved. Ours is not original but is slightly different than those already operating at a number of

other universities. The main principles are as follows:

—A small independent, non-profit making company is set up by the university under guarantee.

—This company is the consulting agency and forms the link between industry, commerce and the university.

—It is to direct the work to the university and will be responsible for the effective organisation and direction of the contract.

Aston University holds the view that the company must be run on strict commercial lines, with no pump-priming grant. So must all contracts placed with the university or other institutions. The object is not to subsidise industry but to help it.

The company is responsible for all financial matters and also takes out an indemnity insurance cover for all registered consultants. It has a small consulting staff of its own so that a number of smaller on-the-spot jobs can be handled immediately. This is really quite a good sales point as the small job, quickly and efficiently done, often leads to the bigger one.

Any profits made by the company must be handed over to the university to be distributed to the departments according to their participation during that year and they will be used primarily for encouraging "free" research.

The company has been running for one year on an ad hoc basis under my direction, with a board of directors chosen jointly from the university and industry. Economically it has not made a bad start: most of the work was for national organisations or larger companies but it also covered the smaller ones, where we are also anxious to make our contribution effective.

Defining Problems

The work so far has varied from a survey of the terotechnological requirements of small businesses for the Department of Trade and Industry to management development assignments for Industrial Training Boards and for employers' federations. At the other end of the scale it has included the study of a company's noise problems and is advising it how to overcome them.

Much of the consultancy work done by Aston Services Ltd is concerned with diagnosing and defining what a company's problem actually is and submitting an effective solution. This often becomes apparent only following an investigation in more detail than the client company's own time or facilities would permit.

Defining and overcoming such problems necessitates a wide multi-disciplinary group of registered staff on tap, supported by appropriate practical resources. These are centred in a factory and offices near the university campus, where a design office, precision machine shop and other equipment and supporting facilities are concentrated.

The author is the Vice-Chancellor, University of Aston, England.

Round Up

Nurul Hasan Calls for Scientific Outlook

A SECTION of our countrymen are recipients of higher education. "This privilege can only be redeemed by cultivating rationality and scientific outlook, deliberate acceptance of austerity and idealism, and dedication to the service of the country, with special emphasis on improving the standards of life for the weaker sections," asserted Prof. S. Nurul Hasan, Union Education Minister, while delivering the annual Convocation of the University of Madras.

Higher education is concerned with the advancement of human capability in the society at large and to train the leadership needed for all the different walks of life; and it strives to realise these objectives by concentrating on the individual student. He said the university system assumes a basic responsibility to provide good educational opportunities for its students to discover their capacities, aptitudes and interests. The university system is thus responsible for a large-scale and integrated effort to give a rounded education to the individual and also to improve society. This is what Pt. Jawaharlal Nehru emphasised in his Convocation Address to the University of Allahabad: "A university stands for humanism, for tolerance, for reason, for the adventure of ideas, and for the search of truth. It stands for the onward march of human race towards even higher objectives. If the universities discharge their duties adequately,

then it is well with the nation and the people."

Emphasising the need for willingness to sacrifice the immediate gain in favour of the long-term objectives, he pointed out that we are now engaged in the tremendous task of becoming self-reliant and removing ill-health, ignorance and poverty from which millions of our countrymen suffer. This can be accomplished only if we show initiative and

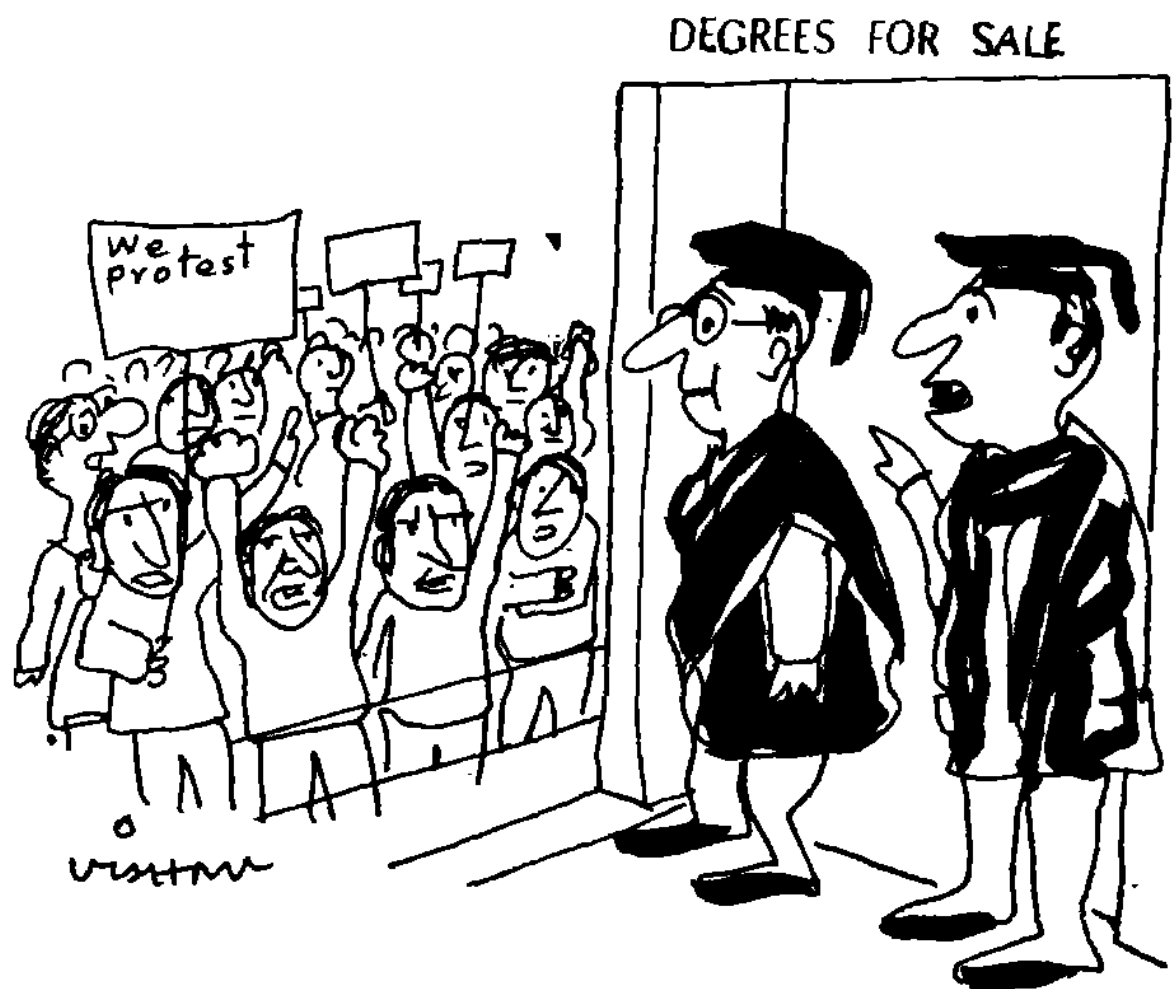
creativity, work hard, produce more and consume less.

Finally, he said, society expects University men and women to be cultured intellectuals with a scientific and rational temper. It is not the acquisition of knowledge that matters—what is important is development of curiosity, the ability to assess the value of evidence objectively and impartially and to determine relativities.

Convocation With A Difference

THE NINTH Annual Convocation of the Bangalore University was memorable for the changed dress, the changed venue and the huge turnout which must surely rank as one of the biggest for an academic occasion in the history of Karnataka. The traditional black academic gown and hood were not worn by either the recipients of degrees or the convocation processionists. They were dressed simply.

The women wore white sarees while the men wore white pants



"They complain that the prices have gone up....."

and shirts or jubbas and pyjamas or panches. The Chancellor, the Vice-Chancellor and other officials of the University who made up the convocation procession, were dressed in white silk gowns without hoods. The Kanteerava Stadium was the venue with the Convocation processionists seated on a dais in the middle of the Stadium.

The proceedings were in Kannada with Governor Mohanlal Sukhadia using the language consistently for the ceremony. Swami Ranganathanandaji delivered the Convocation Address in English but prefaced it with a brief speech in Kannada in which he explained why he decided to speak in English.

Higher Priority for Research Work Needed

THE UNIVERSITIES in the country should give high priority to the promotion of research for their developmental programme in the Fifth Plan, appealed Prof. Nurul Hasan, Union Minister of Education, while delivering the 23rd Annual Convocation of the M.S. University of Baroda.

At the national level, our thinking has been that it would be wrong use of the limited funds available for higher education if they are to be utilised for purposes of expansion. Instead, we should make an effort to spend the least on expansion by limited enrolments for part-time education or self-study.

Emphasising the importance of "funding of research", he said that "the University Grants Commission has a unique position in this regard because it has the primary responsibility to promote a symbolic relationship between teaching and research in universities and affiliated colleges." At present, he said, our investment in research is only about one-half per cent of GNP as against about 3 per cent of what the industrially advanced countries spent. Taken together and operated in coordinated fashion, these different sources may help to raise our research effort in the Fifth Five-Year Plan.



At the Convocation Address function of Sri Venkateswara University

Mere Academic Preparation Not Sufficient

THE TAMIL Nadu Governor, Mr. K. K. Shah while delivering the 16th annual Convocation Address of Sri Venkateswara University, Tirupati said that Universities in the country had to prepare students not merely for academic and conventional education, but also for national leadership.

Education could not be divorced from social, economic and political overtones if developing countries had to attain the level of the most advanced countries. According to him the value of a degree of a University would in future be judged not by the position it secured for a person, but by his capacity to do creative and constructive work for the well being of the country.

Mr. Shah asked the younger generation to give a lead in cul-

tivating democracy as a mode of living. We have been struggling to build up the basic fibre of our democracy and are continuously searching for standards in public life. But the transitional period has been captured by weaknesses of democracy on holidays.

The leadership of the younger generation, he said, should interpret Gandhiji to the vast masses of young men and women and persuade them to imbibe Gandhian values so that democracy could survive and equality of opportunity be ensured.

Mr. Shah also unveiled the statute of The *Thinker* in the University campus, while Shri K. K. Desai, Chancellor of the University declared open the University House, from the same platform.

Radical Changes in Education Necessary

THE GOVERNOR of Gujarat and Chancellor of the South Gujarat University presided over the Fifth Annual Convocation of the University and addressed the fresh recipients of the Degrees, as the Chief Guest. He congratulated the University for making some headway in several directions and taking initiative in academic sphere by introducing General Degree courses designed to meet the needs of specific occupations.

He asserted that the Universities have an important role to play not only as seats of higher learning, but also as places for preparing young men and women who would be capable of preserving the rich heritage of the country and lead it on to higher goals. The courses they teach, the cocurricular activities they under-

take and encourage and, above all, the climate they create on their campuses can go a long way towards fulfilling this role.

Our schools and colleges have produced good administrators, scientists, technicians, engineers, doctors, lawyers, teachers, artists, writers and a host of others in different systems and in an atmosphere of laissez-faire. There may be among them some with a new social outlook, but a few sparrows do not make a summer. Those who are educated and brought up under a system of education tailored to the needs of an imperial setup obviously cannot adapt themselves to the needs of a socialistic society. It is high time, therefore, that we introduced radical and comprehensive changes in our system of education.

We shall need to attend to a few fundamental points, be clear in our minds as to the goal we are trying to reach, identify the impediments in the way, have the will and the determination to remove these impediments, be prepared for hard work and sacrifice to achieve the desired end. The goal is clear enough—it is the goal of a secular, democratic, socialistic society—but the impediments in the way are many and formidable.

The real national unity that we cherish, a unity that is emotional, vital and living, a unity that shall triumph over all narrow considerations of region, caste, class or community, according to him, will not ensue only from a mechanical obliteration of all distinctions through legislation. It should all the more proceed from a genuine understanding on the part of the people regarding the needs of the new society that we wish to

bring into existence. Universities can contribute significantly towards the attainment of such an understanding in a number of ways. They could encourage the study and knowledge of the language and literature and cultural patterns and achievements of different groups in our society and different regions of our country. They could inculcate an interest in the fascinating and complex fabric of our national life and also act against any form of snobbery based on caste and class distinctions. They could also draw up and assiduously follow a schedule of exchange of scholars with other, preferably far away, universities in the country.

He asserted that hard work, sincere and disciplined hard work is the first need of the hour. He urged the young men and women to accept life that lies before them with all its challenges, even with its hardship.

Drug Test for Sportsmen Evolved

WELCOMING the announcement that the means had been found to detect the use of anabolic steroids by sportsmen, Lord Killanin, President of the International Olympic Committee said this is a good news indeed. Any significant progress towards the detection of the drug is welcome to sports officials.

British scientists have finally found a way to detect the presence of body-building anabolic steroid drugs in athletes. Britain's Sports Council said it was informing the International Olympic Committee, International Federations and national governing bodies of sports. Many world records of the past decade are attributed to the use of drugs, which were until recently undetectable. Anabolic steroids, based on sex hormones, are known to be used by many leading world sportsmen despite widespread condemnation of the practice. They build up muscle

Tea Science Courses

THE ASSAM Agricultural University has instituted specialised courses in Tea Science and Technology both at under-graduate and Post-graduate level, since 1968 and 1972, respectively. These courses are the only one of their kind in India and, perhaps, in the world and have attracted students from other countries like Iran, Uganda etc. At present, 7 students from Iran (two of them girls) and three students from Uganda are doing this course at the under-graduate level. At the Post-graduate level leading to M.Sc. (Agri) degree there are in all 11 students from various parts of the country. There is a considerable demand from the concerns and estates connected with Tea Industry for young men specialising in these courses.

tissue, and intensive training then results in greater strength.

The drugs are particularly popular with weightlifters, shot-putters and discus, hammer and javelin throwers but are also used in many other sports, including, sprinting, hurdling, jumping, cycling and wrestling.

The test method is based on a technique called radio-immunoassay. It can detect one-hundred-thousandth part of a millionth of a gram of steroid. The technique is simple enough for one operator to test about 100 samples in three days.

Telecommunication Systems

INDIA'S FIRST batch of indigenously developed electric typewriters will soon roll off the assembly line of Hindustan Teleprinters. The company's R & D unit has developed a wide variety of telecommunication equipment and computer peripherals including a high speed Tape Reader prototype.

The indigenous development of the telecommunication systems is seriously hampered by the non-availability of properly trained and dedicated engineers; and particularly mechanical engineers well-versed with the fine techniques of mechanical engineering necessary to devise moving mechanical systems.

The High Speed Tape Reader developed by the R & D unit can be used as a data-input system for computers. Alternatively, the High Speed Tape Reader can be used to feed data into a Data Modem—another machine being developed by the Hindustan Teleprinters, but based on the designs supplied to it by the Telecommunication Research Centre, New Delhi.

About 350 pieces of the Arabic teleprinters, developed by the company in 1968, have by now been exported to Arab countries, mainly to Kuwait.

PROBLEM OF FISH FARMING IN U.K.

SCIENTISTS ARE working to find a big source of protein for the industrialized population centres of the earth. At Cardiff a new research project is being partly sponsored by a group of industrial firms.

The appeal of fish to the scientists at University College, Cardiff isn't simply as an alternative to meat but attracts them to the possibility of, as they say, 'recycling' the waste that human beings produce intensely populated industrial areas. The soil of the island can't cope with the immense quantities of human sewage. So, instead of being broken down in soil to sustain a natural cycle, the excess sewage is taken out to the sea and dumped, or it is treated and burnt. Either way, it is not put back into the land.

One way to recover the value of all this organic waste matter would be to farm fish, either in the seas to which the waste is consigned, or in fresh water.

Fish farming with human manure is not a new idea. The Chinese were doing it 4,000 years ago, and in England in the Middle Ages the Normans filled their ponds and moats with carp from France.

But carp are not to everyone's taste. Certainly they are not very popular in Britain. And they need special big ponds for breeding. In a country such as Britain, where land is expensive, this is a serious economic disadvantage.

At the Zoology Department of University College, Cardiff, South Wales, scientists are looking into what seems a promising alternative to carp—trout.

Trout, intensively fed, can yield a ten times bigger harvest than carp for every hectare farmed. And trout fetch a good

price—£1 a kilo on the British market. But at present they have got to be fed on imported food, which is expensive.

This is the problem the scientists have been studying, and they have come up with three possible solutions, all of which would make use of some of that precious human sewage which is now being wasted.

The basic idea is to grow certain animals directly on the sewage—and the animals they have got in mind are ones that trout feed on. The three that seem most suitable to the scientists after their analysis of the situation are all spineless animals. One is a worm and another is the freshwater mussel. And the third is daphnia, the fresh water flea. All these creatures thrive on suspended or deposited organic material—treated sewage, in other words.

So good is the possible yield from trout ponds nurturing these animals that the researchers are already talking of restocking Britain's rivers with trout bred in the ponds. The proposed trout farms could speed up the recovery tremendously.

Problem-Solving Study Necessary

THE CONCEPT of peace and its study and research in India should be conceived in a broad sense, comprehending not only the elimination of tensions and conflicts that flare up in violence, but also the building of new attitudes and conditions for a more harmonious society, said Mr. Prem Kirpal, President of the Executive Board of UNESCO.

Inaugurating a seminar on "Peace Research", organised by the Panjab University at Chandigarh, he said that this concept of peace should contribute to wiser

and faster development, attainment of a way and quality of life that reflected finer human values and brought happiness to the people. To attain this objective of individual and social development, the sciences of man, both human and social, should be oriented to problem-solving study and research at the University.

He traced the sources of violence in six areas of human activity—the power structure on the political system, wealth and material possession on the economic system, international relations, the cultural factor or the search for belonging, ideology or belief and faith and the problems of inner man or quest for personal security, balance and harmony. He suggested a number of concrete subjects and problems for study and research under each of these areas. In his presidential address, Mr. Suraj Bhan, Vice-Chancellor of Panjab University suggested that there should be a peace research cell at every university where eminent thinkers should be engaged in a perennial quest for ensuring a lasting peace. He regretted that the only choice left to mankind today was either to exterminate war or exterminate itself. It was, therefore, high time to pool all our resources and know-how to create conditions for peace. It was not the concern of one man, one nation or one discipline. A considerable number of fearless and free individuals must devote themselves for exploring conditions that result in the extermination of war.

Science for Solving Population Problem

BASIC RESEARCH in science, which was a time consuming process, would eventually help solve the food problem and also the stupendous problem of population control, said Prof. Choh Hao. The Indian Government should give maximum help for the development of basic research in science and try to bring back the Indian talent abroad.

Prof. Choh, Director, Hormone Research Laboratory, San Francisco, U.S., who presided

over the six-day symposium on Advances in Chemistry, Biology and Immunology of Gonadotropins at the Indian Institute of Science, Bangalore, said that population control was a massive problem. India has done tremendous work during the past 10 years in this field.

The fertility could be controlled by activating gonadotropins, a hormone which controls reproductive function. So far scientists had succeeded in stimulating fertility by activating these hormones in the human system. The reverse process—namely “inacti-

vating” hormones, in human beings to control fertility—was now the subject of research. This had been successfully done in regard to rats and monkeys.

Dr. N. R. Modgal, Professor at the Centre of Advanced Study in Biochemistry, Indian Institute of Science, had achieved notable success in “inactivating” gonadotropins in the lower species. The present research was in the direction of applying the results of recent findings to human beings for controlling fertility leading to population control.

DOCTORATE FOR EPPLER

A SPECIAL convocation was held at the IIT, Madras to confer an honorary degree of Doctor of Science on Dr. Eppler. Thanking the University for the honour, he said that in awarding him the degree “you have had the friendliness of recognizing the effort and the achievement of German technicians and scientists who have been given the chance to cooperate with their Indian colleagues in the Indian Institute of Technology.”

Dr. Eppler went on to say a few words about development and growth problems: “Social scientists in Japan, in the United States, in Great Britain and the Federal Republic of Germany are trying to define indicators capable of measuring the quality of life in a society. Such indicators, partly coincide with what we call the standard of living: they include consumption of food, housing facilities, purchasing power. But they also include chances of education and recreation factors which—for good or bad—influence health, such as air and water, they include freedom and security, the quality of community life, and, above all, labour conditions.”

“I am fully aware that what I have said is just an attempt at

convincing you that progressive thinking in Europe does not gloat at the expense of the Third World. The search for a better quality of life will bring together and not separate the industrialised countries and the Third World. Let us do our best and this will come true.”

Computer Centre Inaugurated

DR. EPPLER inaugurated the computer centre at the IIT, Madras. Speaking at the inauguration, he said that “for many years during our cooperation with the Indian Institute of Technology, the German side has been aware of the desirability of having electronic data processing equipment at this outstanding institute of highest technical studies.

“The result of our discussions is this fast and versatile 370/155 IBM computer system of which I may say on this occasion no technical university in Germany can boast of possessing. However, since this computer is not only to serve the requirements of the Institute of Technology but also to cater to the needs of other educational, governmental and research institutions as well as industries in south India,

it was felt that the surplus capacity of this data processing machine was essential for meeting these needs.

"The elaborate laboratory equipment provided under the Indo-German Agreement and equally this most modern computer, can yield valuable funds which should enable this Indian Institute of Technology to maintain the high standard. Sophisticated equipment available to its staff and students after the Indo-German collaboration in this project has shifted from the governmental level to university partnership."

CSIR Science Cell to Study Decisions

THE COUNCIL of Scientific and Industrial Research was setting up a cell for science, technology and development to study how social and political decisions affected growth of national and international dimensions of science and technology, said Dr. Y. Nayudamma while delivering Prof. S. Bhagavanthams 60th birthday commemoration lecture at Hyderabad. He said that the CSIR had adopted Karimnagar district of Telengana region in Andhra Pradesh to bring science to the doors of its people and to put science to use for its development and growth.

Technology is imparted with the hope that it gives a flying start and would soon make us self-reliant, said Dr. Nayudamma and added, our experience has belied our hopes. We now realise that developing indigenous technology is a must if only to assess what to import and how to improve upon it.

The scientists could only provide alternatives, rational and optimum choices to the people in power to make valid decisions. He held the view that the plan should be from grass roots to meet the basic needs of the people and this should be accompanied by the political will and determination to put science and technology to work and fully involve and make the people participate in it.

U.S., Indian Scientists to Meet in India

INDIA'S AMBASSADOR to the U.S., Mr. T.N. Kaul, stated at a meeting of the Executive Club of Chicago, recently, that the first of a series of meetings at the Governmental level between the Indian and American scientists is due to be held in India early in 1974 to identify areas of collaborative endeavour.

Energy research and dry farming, he said, were among the subjects likely to be discussed. Work by Indian agricultural scientists in collaboration with U.S. Department of Agriculture had already proved beneficial to agriculture.

According to Mr. Kaul from an Indian study of 15,000 types of sorghum an elite group was selected and brought to the U.S. for cross-breeding and release to American farmers. These types according to U.S. Agriculture Department had not only broadened the diversity of American sorghum but also added valuable genes for resistance to disease and insects.

Several other instances of collaborative scientific activity between the two countries in fields such as fisheries, meteorological and hydrological research could be cited.

Mr. Kaul in his speech to the club, said that multinational corporations could play a role in India if they were prepared to contribute to the goal of self-reliance in export development and technological advance.

Convocation for Doctorates Only

ACCORDING to a decision of the Academic Council of Delhi University, only doctoral students will be admitted to the annual Convocation from next year. The Council decided that the Convocation would be held in a closed hall, and not in the open as is the practice now.

The change had been necessitated by a large number of postgraduate students admitted to the Convocation. The annual Convocations were also becoming one of the focal points of student agitations.

The Academic Council also accepted in principle the right of participation of students in the decision-making bodies of the University and formed a committee to determine the mode and quantum of student participation.

"Developing Good Study Habits"

A THREE-DAY Seminar on "Developing good study habits" under the presidency of Dr. D. Jaganatha Reddy, Vice-Chancellor of Sri Venkateswara University was inaugurated recently by Prof. M. V. Rama Sarma, Principal, S.V.U. College, Tirupati.

Dr. Reddy, at the outset stressed the need for cultivating the habit of reading for all in general and the teachers in particular for developing locational and interpretative skills and reading for pleasure. With regard to the question of equipping the library with suitable books, he suggested that teachers' requirements and students' tastes and aptitudes should be met.

Prof. M. V. Rama Sarma in his inaugural speech pointed out the crucial role of the school library in engendering and fostering study habits for creative and critical thinking. He made a detailed analysis of the various skills and abilities that should form the

study habits of students at different levels.

Prof. R. Srinivasa Rao, Head of the Department of Education and the Director of the Seminar, while welcoming the gathering, said that the study habits should form the central tool of the teaching-learning process and only then there would be a qualitative improvement in education.

PERSONAL

1. Mr. J. D. Sharma, IAS, has taken over as Vice-Chancellor of Jammu University w.e.f. December 12, 1973.

2. Mr. N. N. Kashyap, Chief Secretary to the Haryana Govt. has been appointed Vice-Chancellor of Haryana Agricultural University.

3. Shri Roop Narain Jha has been appointed Registrar of Bhagalpur University w.e.f. November 29, 1973.

Education Board to Meet

MOST STATES in the country have agreed to have a uniform system of education, Prof. S. Nurul Hasan, Union Education Minister, informed the Consultative Committee of MPs attached to his Ministry.

This will be based on the 10+2+3 pattern laid down in the National Policy Resolution on Education. Some States had not yet taken any firm decision in the matter and a meeting of the Central Advisory Board of Education will be called early next year (1974) to consider this. He will also consult the Advisory Committee of Vice-Chancellors.

The Fifth Plan, Prof. Hasan said, will aim at introducing this pattern. A uniform educational structure will facilitate the inter-flow of students among the States strengthening the forces of national integration.

The Minister said that the Fifth Plan for Education, as finalised at present, has an outlay of Rs. 1,726 crores as against Rs. 3,200 crores originally suggested.

He agreed with a suggestion that there should be no segregation of students and the hostels for members of scheduled castes and scheduled tribes should also have a certain percentage of other students.

Plan to Reclaim Rann of Kutch

THE GEOLOGISTS of M. S. University of Baroda propose to reclaim the area of the little

Rann of Kutch. Giving its details, Dr. S. S. Merh, Head of the Department of Geology and Mr. Bhaskar Roy a geologist who conducted the studies said that the reclamation posed a challenge to the geologists and the engineers. The little Rann might be comparatively easy to reclaim. He ruled out the possibility of turning the Great Rann green unless a large supply of fresh water was available. On the other hand the prospects of the Little Rann being reclaimed were good because of the favourable geographic location and the presence of a number of major rivers flowing into it from the east and west.

ICMR Awards for Medical Research

TEN MEDICAL scientists have been selected by the Indian Council of Medical Research for award of prizes for outstanding original research work in Biomedical Sciences.

Basanti Devi Amir Chand Prize this year goes to Dr. C. R. Krishna Murti, Deputy Director, Central Drug Research Institute, Lucknow, for his work on Molecular Biology and Amoebic Encystment.

Five scientists selected for Shakuntala Amir Chand Prizes are: Dr. R.K. Chandra, Assistant Professor of Paediatrics, All India Institute of Medical Sciences, for work on Immunoglobulins and Nutrition; Dr. H. G. Desai, Assistant Physician, Nair Charitable Hospital, Bombay, for work on Gastric Acid Secretion; Dr. Kamala Krishnaswami, Senior Research Officer, National Institute of Nutrition, Hyderabad, for work on Pellagra; and Dr. Biswaranjan Maiti, Pool Officer, College of Science & Technology, University of Calcutta, for work on Uropygial gland.

Dr. B. K. Aikat, Dean, Post-graduate Institute of Medical Education & Research, Chandi-

garh, for his outstanding contribution in the field of immunological research, will receive Dr. P. N. Raju Oration Award.

Dr. T. Ramachandra Rao, Director-Consultant, ICMR, has been selected for Dr. Y. S. Narayana Rao Oration Award, for his contribution in the field of Microbiology.

Raja Ravi Sher Singh of Kalsia Memorial Cancer Research Award will be given to Dr. V. Shanta, Associate Director, Cancer Research Institute, Madras, for her contribution on the Etiology and Therapeutics of oral cancers.

The recipient of Dr. V. N. Patwardhan Prize for Nutritional Sciences will be Dr. (Miss) Mah-tab S. Bamji of National Institute of Nutrition, Hyderabad.

The scientist selected for the Sandoz Oration Award for Cancer Research is Dr. M. B. Sahasrabudhe of the Cancer Research Institute, Bombay, for work in the field of Cancer Chemotherapy.

These Awards were recently announced by the Scientific Advisory Board of ICMR.

U.G.C. INITIATES EXAM REFORMS

MR. NURUL HASAN, Union Education Minister, recently told the Rajya Sabha that a dozen universities would initially start implementing the examination reforms as formulated by the University Grants Commission. He however did not elaborate.

The University Grants Commission has selected the following 12 universities for implementing the plan of Action for Examination reforms :

Aligarh Muslim University.
Andhra University.
M. S. University of Baroda.
Panjab University.
Gauhati University.
Rajasthan University.
Jadavpur University.
Poona University.
Saugar University.
Mysore University.
Madras University and
Calicut University.

Assistance will be provided to these universities for examination reform programmes by the Commission within the available funds. These universities are expected to serve as a pace setter for introducing similar innovations in the neighbouring universities. The UGC has circulated the document entitled "Examination Reform—A Plan of Action" to all the universities as well as all the colleges.

Following are some of the salient features on examination reforms:

1. Those who teach should also examine. In this sense examinations must become 'internal', and an integral part of the teaching process.

2. Since sessional or continuous assessment measures a number of essential abilities (such as drive and capacity for hard-

work, motivation, quality of imagination, intuition and speculation, leadership and team work, skilled use of hands etc.) which a terminal examination or an achievement test does not measure, such assessment must be shown on the grade-sheet separately.

3. The 'standard' of every institution is ultimately governed by the standard of education imparted by it. In this sense every university or college has to maintain and define its own standard. This implies that the name of the institution/colleges should be mentioned on the diploma or degree or grade sheet.

4. If the award for a degree or diploma or examination depends on the performance of a student in a number of courses, these courses should be delinked from each other, so that if a student has failed to make the grades in a particular course he may not be penalised in other courses due to this failure.

5. The performance of students must be assessed over well-distributed intervals of time so that a course which is completed in a year or a semester must come up for the examination at the end of the year or the semester, without having to wait for 'final' examination.

6. The performance of students cannot be measured so accurately and so unambiguously as to be recorded in marks and since the standards of judgement for various subjects are also different, students must be awarded grades and not marks at the examinations and assessments.

7. Examinations to determine the terminal performance of students in a course or towards a degree, or measure of achievement should be distinguished from entrance examinations (which

Items in this and the next three pages are based on information given in Parliament.

Illiteracy Rate

THE ILLITERACY rate in India as revealed by the census figures is : Rural—76.26 per cent and Urban—47.56 per cent. The percentage of illiteracy in the age group 15-24 is estimated to be 52.53 as per a Government announcement.

The Fifth Plan proposals envisage coverage of a sizeable number of illiterate youth in the 15-25 age group by a non-formal education-cum-literacy programme.

may partly be aptitudinal and predictive) to either service or other courses of study. This implies that institutions preparing students for certain degrees should hold examinations/assessments as an integral part of their teaching programme.

On the other hand, if the number of applicants for admission to an institution exceeds the number of seats, the institution should hold its own entrance examination/tests so that the fitness of a student for the particular course may be judged on a common basis.

8. A National examination in various subjects at the bachelor's level may be conducted by

a central authority, on a purely voluntary basis. This examination could be designed to test creative thinking and comprehension of subject matter, so as to serve as a national index of performance and achievement by students at large and of various institutions. The examination ought to be conducted in all the regional languages and English and it should use a modern syllabus and the best techniques of paper setting, evaluation and processing of raw scores. A certificate carrying a grade should be issued to only those participants who achieve the higher grade. The examination should be open to everyone who wishes to take it.

9. In order to provide an opportunity of further study to those who fail to gain admission to any institution, correspondence courses should be widely organised and courses should be run by the 'Open University' so that one who so desires may get a degree by appearing at the examinations conducted by such a University, or national board, even without formalities of enrolment or attendance.

Uniform Pattern of Education

AT ITS 36th Session held in September, 1972, the Central Advisory Board of Education reiterated its earlier recommendation to adopt a uniform pattern of education in the country consisting of 10 years of primary/secondary education followed by 2 years of higher secondary education and 3 years' degree course. The salient features of the scheme were considered by the Standing Committee of the Central Advisory Board of Education at its meeting held in June 1973. The recommendations of the Central Advisory Board of Education are being considered by Delhi Administration.

With the adoption of the new pattern of education, a student will get his Master's degree after a minimum of 17 years of education instead of 16 years as at present. This would

not affect the candidate desiring to appear for the competitive examinations for recruitment to All India Services since the minimum eligible conditions for such examination is a degree of a university and must be between the ages of 20/21 to 26.

The Council for Indian School Certificate Examinations to which the convents and some of the private schools in Delhi are affiliated, is also examining the adoption of new pattern of education.

The report of the National Committee on the new education scheme set up by the Government of India last year to suggest practical steps to be taken for the implementation of the uniform pattern of 10+2+3 for school and college classes in all States and Union Territories is expected shortly.

New UGC Awards for Science

THE University Grants Commission has instituted three awards of the value of Rs. 10,000 each per year to be given to outstanding scientists. One of these is in memory of Dr. C. V. Raman, for Experimental Research in Physical Sciences. Another, to commemorate Dr. Homi J. Bhabha, will be for Research in Applied Sciences. The third will be in memory of Dr. Meghnad Saha, for Theoretical Sciences.

Nominations for the awards have been invited from universities, research institutions and organisations, professional societies and national organisations connected with the three fields. Selection will be made in consultation with experts in respective fields and on the recommendation of a Jury to be appointed by the UGC.

Only contributions by Indian Scientists, whether by an individual or by a team of two to three persons, will be eligible for these awards. The institutions or organisations are not covered under the scheme. The prize will be given for outstanding scientific work which has made conspicuous contribution to human knowledge in the areas covered by the scheme and has thrown new light on the problems involved. The focus will be on specific contributions made during the last five to seven years.

The scientific work to be assessed will cover books, monographs, research papers or any other published or unpublished account of research work, inventions and discoveries. The work should have been carried out in India.

Engineering Graduates

THE NUMBER of engineering graduates who passed out in 1970, 1971 and 1972 was 17,768, 18,223, and 16,505, respectively.

According to the live Registers of Employment Exchanges in the country, 22,832 engineering graduates were registered as job seekers at the end of 1972. The number of engineering graduates who were provided practical training facilities under the stipendary scheme of the Ministry of Education, Social Welfare and Culture, during the years 1970-71, 1971-72 and 1972-73 was 5,679, 4,517 and 5,508 respectively.

The per capita expenditure on engineering graduates varies from institute to institute. However, according to the information available with the Government the amount generally ranges between Rs. 2,000 and Rs. 3,500 per year.

N.R.D.C. Offered 79 Processes

THE CENTRAL Mechanical Engineering Research Institute (CMERI), Durgapur offered to National Research Development Corporation (NRDC). 79 processes upto 1st April, 1972 for commercial exploitation, of which 36 have been released by NRDC to industries. Besides, the Laboratory have rendered technical aid, consultancy and testing services to industry.

Of the 36 processes released to industry through NRDC, 20 are in production, according to Mr. C. Subramaniam, Minister of Science and Technology.

Some parties have lost interest since release of the process to them. Other processes are under development for production. NRDC and the Institute are taking active steps to see that the

parties licensed are assisted to go into production. The NRDC is also publicising the other processes to elicit the response of interested parties.

Commodity Oriented Laboratories

THE SARKAR COMMITTEE in Part II of its report has recommended that C.S.I.R. may examine the possibility of converting some of the commodity-oriented Laboratories, such as the Central Glass & Ceramic Research Institute, Calcutta, Central Food Technological Research Institute, Mysore and Central Leather Research Institute, Madras into co-operative Research Associations.

The recommendations of the Sarkar Committee were forwarded to the Directors of the concerned Laboratories/Institutes, according to Mr. C. Subramaniam, Minister of Science & Technology, for their comments, which are to be placed before the next meeting of the Governing Body of the CSIR for consideration.

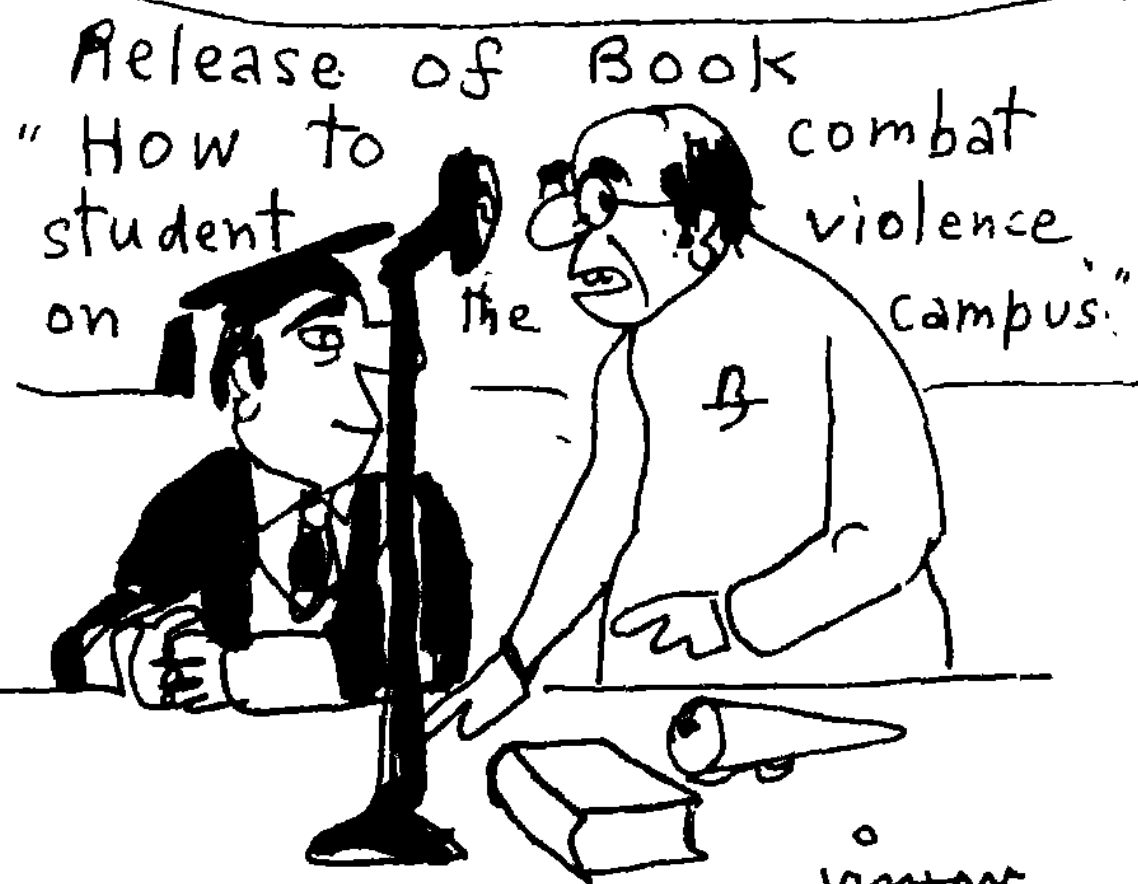
INDO-SOVIET COLLABORATION

AN AGREEMENT for joint programmes in the field of Earth-Sciences has been entered into between the Indian and Soviet side of the Indo-Soviet Joint Committee for scientific collaboration.

There is a provision for exchange of scientists between the two countries and supply of equipment by the Soviet side to the Indian side for specific projects as and when necessary. The following two projects have been identified in this programme:

(i) Studies on geo-magnetic and geo-electric micropulsations in India;

(ii) Crustal studies in the Indian Peninsula shields using deep seismic sounding techniques.



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UGC Research Scholarships

THE UNIVERSITY Grants Commission have a scheme to award Junior and Senior Research Fellowships in science and humanities, including social sciences, for advanced study and research. The Commission, in addition to awarding these fellowships on all-India basis, have also placed separate funds at the disposal of the universities for implementation of the Junior Research Fellowship Scheme in humanities (including social sciences) and sciences. Scholars possessing Masters' degree and engaged in research work in music/fine arts are also eligible for award of fellowships under these schemes.

The details of the scheme are:
VALUE:

The value of the Junior and Senior Research Fellowship is Rs. 300 and Rs. 500 p.m. respectively. In addition each fellowship carries an annual grant of Rs. 1,000 for meeting authorised contingent expenditure connected with the research work. Provision also exists for a grant of Rs. 2,000 during the tenure of award for publication of the research work completed during the tenure of fellowship and for approved field work by the Fellow. The fellowship and contingency grants are exempted from Income Tax.

In deserving cases, the Commission may protect the emoluments of teachers selected for award of Senior Research Fellowship upto Rs. 750 (inclusive of the value of the fellowship).

ELIGIBILITY:

(a) Junior Fellowships are open to persons preferably below the age of 30, who have at least one year's research experience after obtaining master's degree of a recognised university in the first or second class.

(b) Senior Fellowships are intended for research workers and teachers preferably below the age of 45, who have obtained a Doctorate Degree or have equivalent published research work to their credit and have already proved their aptitude for original and independent research.

CONDITIONS OF AWARD

(a) The awards are tenable at any University/College or Institutions approved under the University Grants Commission Act.

(b) The Fellows are required to do whole-time research work under approved guidance in a subject selected by him and approved by the University.

(c) The Senior Research Fellowship is tenable for a period of two years. It can be extended upto a period of one year in special case on the recommendation of the Supervisor and the Institution. Junior Research Fellowship is tenable for a period of three years.

Job Opportunities for Scientists

THE SCIENCE and Technology Plan is expected to give job opportunities to at least 100,000 scientists and engineers during the Fifth Plan period, Science and Technology Minister, Mr. C. Subramaniam disclosed this while replying to a question in the Lok Sabha. He said the plan was expected to absorb not only those coming out of universities and research institutions but also those technologists and scientists working abroad for want of sufficient opportunities in this country.

He said most of the Indian

scientists abroad had gone for higher training, and found better opportunities there. Various steps were being taken to bring them back to the country.

It was estimated that over 15,000 qualified scientists, 22,000 engineers and 50,000 other diploma holders were presently unemployed in the country.

Scientists Not Fully Objective

THE SCIENTISTS are not fully objective, observed Prof. Jayant V. Narlikar, internationally known physicist. He said the scientists were, perhaps, the most conservative in holding to the old laws, in spite of their statements to the contrary. They were extremely hesitant to change the existing laws unless they were "really forced" to do so by actual evidence. While delivering the Institute of Science Golden Jubilee Frontiers of Science lecture, he said, there was a revolution in physical ideas when the relativity and quantum theory was propounded. The sole criterion for the survival of a physical law was complete success. The field of application of physical laws is the entire universe.

Indian Students Abroad

ACCORDING TO the Ministry of Education, Government of India, the total number of Indians studying abroad at present under various cultural agreements is 410. The highest number are in USSR (136), followed by France (117). There are 32 Indian students studying in Federal Republic of Germany, 7 each in Czechoslovakia and Yugoslavia and 15 in G.D.R.

During the current year out of a total of 223 students selected only 186 have so far gone abroad, the highest number being to the U.K. (80), U.S.S.R. (30), Canada (18) and France (19).

PHYSICAL SCIENCES

Mathematics

1. Bhaskar Rao, A. Generating functions and other results for certain polynomials involving two or many variables. I.I.T., Delhi.
2. Juneja, Shanti. A study of discontinuities and regular flows in non-relativistic and relativistic magnetogasdynamics. I.I.T., Delhi.
3. Keshav Rao, K. Kinematic aspects of fluid flow theory. Osmania University.
4. Krishna Reddy, Dandalaradha. Certain investigations in Brans-Dicke scalar-tensor theory of gravitation. I.I.T., Delhi.
5. Nagpal, Om Prakash. A study of the optimum transfer trajectories of rockets. University of Delhi.
6. Pratap Singh. Interior ballistics of guns and rockets. University of Delhi.
7. Puri, Munish Chander. Optimisation through extreme points. University of Delhi.
8. Raina, Bushan Lal. Optimal rules of numerical integration for analytic functions. I.I.T. Delhi.

Physics

1. Agarwala, Shashi Bala. Lattice dynamics, neutron scattering and band structure of one - and two - dimensional lattices. I.I.T., Delhi.
2. Anil Kumar. Microwave pressure broadening studies. University of Delhi.
3. Ashok Kumar. Non-central interactions in metals. I.I.T., Delhi.
4. Bhambure, Uddhav Krishnaji. A study of VLF atmospherics/VLF radiowave propagation. University of Poona.
5. Krishna Rao, P.S.R. Ultrasonic investigations of molecular structure of some organic liquids. Osmania University.
6. Malik, Dharampal Singh. Focusing of laser beam in an inhomogeneous medium. I.I.T., Delhi.
7. Risal Singh. Electronic, vibrational and EPR studies of some impurity doped alkali halide crystals. I.I.T., Delhi.
8. Saraf, Padmaker Dhananjaya. Electromagnetic wave propagation in anisotropic conducting media. Ravishankar University.
9. Sehgal, Harash Kumar. Optical properties of impurity doped alkali halide crystals. I.I.T., Delhi.
10. Shrivastava, Dwarka Nath Sitaram Lal. Some aspects of luminescence of doped and pure alkali halides phosphors. Kanpur University.
11. Syed Nasimul Haque. Semiclassical treatment of atoms in intense electromagnetic field. University of Delhi.
12. Vikram, Chandra Shekhar. A study on holographic motion problems. I.I.T., Delhi.

Chemistry

1. Agarwal, Manju. Biosynthesis of proteolytic enzymes for industrial use. Kanpur University.
2. Amba Lal. Studies in the oxidation of organic compounds with active manganese dioxide in neutral media. Vikram University.
3. Anil Kumar. Kinetics and mechanism of the oxidation of pulp and its various organic constituents. Meerut University.
4. Azhar, Salman. Chemical changes and enzymes induction during seed germination. Kanpur University.
5. Bakshi, Narendra Pal Singh. Studies in the naphthalene analogues of sulphonamides. Kanpur University.
6. Basir, Anil. Chemistry of pashanone and related com-

pounds of *Didymocarpus pedicellata* (roots and leaves). University of Delhi.

7. Brahm Parkash. Synthesis and chemistry of arylidene chromanones and chemical components of the heartwood of *Dipterocarpus macrocarpus*. University of Delhi.
8. Chauhan, Ashok Kumar. Studies on blue perchromate prepared in presence of thiocyanate ions. Ravishankar University.
9. Das, Ajit Kumar. Complex compounds of organic ligands with cerium. (III). Vikram University.
10. Dhingra, Vijay Kumar. Colouring matter of some important natural products. University of Delhi.
11. Gupta, Chakra Ved. Studies on addition polymerization. Jabalpur University.
12. Gupta, Pyare Lal. Physico-chemical characteristics and performance of fuels/lubricants. I.I.T. Delhi.
13. Kamble, Baban Genu. Use of 2, 3-4 trihydroxyacetophenone as analytical reagent. University of Poona.
14. Kuchhal, Rakesh Kumar. Studies on some stationary phases and determination of thermodynamic parameters by gas chromatography. Meerut University.
15. Pardeshi, Nalini. Synthesis of naturally occurring coumarins and a study of plant drugs. University of Delhi.
16. Patel, Mahendra. Thermodynamics of surface films at liquid vapour and liquid-solid interfaces. I.I.T., Delhi.
17. Rastogi, Vijay Kumar. Studies on the biochemistry of degradation of cellulosic materials by the fungus *Chaetomium globosum*. Kanpur University.
18. Rawat, P.C. Some reversible and irreversible processes at D.M.E. in aqueous and non-aqueous solvent mixture. University of Rajasthan.
19. Rizvi, Syed Shamim Ahmad. Studies on bromoantimonates (III). I.I.T. Delhi.
20. Sarkar, Sukumar. Mixed ligand complexes. University of Burdwan.
21. Sriraman, M.C. Studies in Indian medicinal plants. University of Poona.
22. Teotia, Mahendra Pal. Physico-chemical studies on the integration of amino compounds with metals and metal-cyanides. Meerut University.

Earth Sciences

1. Borkar, Vidyadhar Dattatray. Stratigraphy and palaeontology of the area around Wadhwan, Saurashtra. University of Poona.
2. Hanmanth Reddy, P. Sedimentological studies south of Nagar unasagar Dam. Osmania University.
3. Kesava Rao, Chennu Veerannadi. Sedimentological and palaeontological studies on Gondwana and tertiary sediments of Coastal Andhra. Osmania University.
4. Madhav, Uppaluri Bindu. Studies on the possibility of geomagnetic field reversals during Deccan trap volcanism. Osmania University.
5. Ramana Rao, A.V. Some geological and geophysical investigations in Veldurti-Gani Area, Andhra Pradesh. Osmania University.
6. Sarma, Sarthachandra. Structural analysis of the magnetite-quartzites of Ongole District, Andhra Pradesh. Andhra University.

Engineering & Technology

1. Balakrishna, R.S. Studies in the chemical modification of vegetable oils. Osmania University.
2. Biswas, Kanad Kishore. State augmentation approach to smoothing problems. I.I.T., Delhi.

(Continued on Page 49)

Selection, Training and Coaching of Players for International Sports Meets

These are some of the suggestions made by the All India Council of Sports regarding selection, training, and coaching of players for participation in international events and the duties and functions of the accompanying officials.

TRAINING of Sportsmen is a long and continuous process which helps in harnessing their physical and mental qualities to a performance of exceptional level. The two important partners in training are the sportsman and the coach. Hence the selection of both is important. In our country we think of training in terms of holding sporadic short duration camps by coaches appointed off-hand and the results are very much known to us. The training has to be tackled as a long term plan and team for participation in the international events like the Asian Games, Commonwealth Games, Olympic Games and the World Championships must have a sound preparation of at least 2 years.

Each Federation should appoint a National Coach in consultation with the All India Council of Sports and the Netaji Subhas National Institute of Sports for a minimum duration of 2 years. The training should be done under the charge of this coach who can choose one or two more coaches to assist him. In case of individual sports like Athletics the training should be handled by more than one coach because of the different nature of various events. The planning for training and competition should be done two years in advance and the Federation should see that the plan is implemented. All teams and competitions should be finalised at least one year in advance so that these can be fitted into the training plan.

Training Cycle

The four-year training cycle should be adopted for preparing the teams for the Olympic Games. It should be further divided into two-year cycles—one should end with participation in the Asian Games and the next with Olympic Games and should start immediately after the Asian Games are over. This way the Asian Games and the Regional Championship will become a stepping stone for the bigger events i.e. Olympic Games/World Championship.

After detailing the training programme, the AICS suggests that in each year 3 camps of three weeks duration each should be held e.g., first camp—March/April, second camp—June/July and third camp—September/October. During this year the probable should only be allowed to compete after the first two camps are over so that the real emphasis can be kept on the development of motor qualities and the basic techniques. The third camp should be held before the major

competition sets in so that the players learn the final techniques before they go to participate.

It suggests that the National Coach should witness all the major tournaments including the Services, Railways and Inter-University meets etc. to watch the performance of all these sportsmen and analyse them. He should also meet all the probable players after the Championship or the tournament is over, discuss with them their weak points and advise them on their future training. The training plan which is prepared by the National Coach assisted by other coaches will have to be implemented with the help of the other coaches who are working in the various regions of the country. A copy of the training plan and the training schedule should be sent to these coaches who may ensure that the players from their region keep on working on those schedules. During the second year of the training the final team should be selected and put under concentrated training. As far as possible this team should be made to play together in a number of tournaments during this time. This team should be entered in the major tournaments so that the competition experience is gained by the team as a whole.

Release of Players

Government Departments, Public Sector Undertakings and other agencies, it suggests, should willingly spare their employees selected for undergoing training at coaching camps, on full pay basis.

On the question of venue it says: The training should preferably be held at the Netaji Subhas National Institute of Sports where excellent facilities exist and the weather for most of the time is good.

The Netaji Subhas National Institute of Sports is already to hold three coaching camps in a year which are approved by the Ministry and one camp for the Juniors so that the emphasis is laid on the youth. The Federation should take the advantage of this scheme and get the planned training implemented. The training can also be held at other suitable training centres under the auspices of NIS in case the climatic conditions and the facilities are better available there.

Evaluation: The evaluation of the training done by the players every year should be done by an expert team including the National Coach. This expert team may advise the National Coach in case any discrepancies are noted in the training.

Medical Examination: All players/sportsmen should be medically examined regularly each year by an expert sports physician and the action should be taken on the advice given by him from time to time. During the coaching camps in particular, the services of a Sports Doctor be made available. He should also carry out a thorough medical check-up of the players.

Selection: There has been a strong criticism regarding the selection of various National teams because of casual methods used for selection. There have been reports that the selection is guided not by merit alone but by favouritism and regionalism. Steps,

IUB & SPORTS

The University Grants Commission has approved and sanctioned grants totalling Rs 55,19,128 for 1972-73 for construction of gymnasia in 33 universities and 85 colleges; construction of play fields in 36 universities and 314 colleges.

These are under completion in most of the cases. The progress of construction has been rather slow because of scarcity of building materials.

The Inter-University Board organised the following activities:

Coaching Camps

A total of 296 university, inter-university and zonal level coaching camps for university sportsmen were organized upto 1972-73. Each camp was attended, on an average by 100 university sportmen.

Sports Talent Scholarships

Fifty sports scholarships of the value of Rs. 100 per month each to talented university sportsmen were sanctioned each during 1970-71, 1971-72, and 1972-73.

International Competitions

A contingent of university sportsmen was sponsored for participation in the World Games for University Students "Universiad-73" held at Moscow during August, 1973.

According to Deputy Education Minister Arvind Netam's reply in the Lok Sabha although the gymnasia and play fields approved under the Scheme in various universities and colleges have not so far been completed, the impact of the programmes implemented through the Inter-University Board has shown encouraging results.

Since the scheme was initiated, a number of university players have achieved distinction in various National level sports tournaments, and were included in various National teams for participation in International sports events. The results are likely to manifest in greater measure in future when university players who have had the benefit of expert coaching for longer number of years attain peak competitive form.

During 1970-71, 50 sportsmen in universities were awarded Sports Talent Scholarships. The number of such scholarships increased to 84 in 1971-72, and 89 in 1973-74.

It is felt that the award of these scholarships to outstanding university sportsmen is a source of encouragement to the recipients to achieve better proficiency in their respective games.

therefore, have to be taken to make the selection fool-proof to ensure that the sportsmen in the team or others are selected purely on merit. To avoid such criticism it has made detailed suggestions on the subject which should be followed in future.

The Selection Committee should consist of not more than 5 members, having atleast 3 ex-international players in the respective games.

No office bearer of a Federation should be a member of the Selection Committee.

Selection of the Manager

The Manager designate should be a co-opted member of the Selection Committee. It will also be worthwhile to co-opt the Captain of the team for the selection purposes in case of team sports. Only those persons should be made the members of the Selection Committee who can be available for watching all the major tournaments and attend all the meetings of the Selection Committee. Any Selector who has abstained from more than two major tournaments/championships/Selection Committee meetings should lose his membership and may be replaced.

The Manager of the team should be a man of National standing either in respect of his personal performance in the sport concerned or should be a top organiser. He should have proved his worth earlier in managing the teams in smaller International competitions.

He should have good knowledge of rules and officiating. He should have the qualities of good leadership and should be able to instil confidence in the players. He should also have the confidence of all the players.

He should have International connection in the sport; be sincerely devoted to the sport and should have a good technical knowledge in the sport so that he can help the coach in training. He should be a good disciplinarian, of good behaviour and should be tactful. He should be able to use his authority at times when needed and maintain strict discipline in the team.

Besides being a good public relations man he should be able to maintain contact with the press. The Manager of the team should be selected at least one year in advance so that he has enough time to know the team thoroughly and should be present in all camps to watch the training and the habits of the players.

He should be a good psychologist and one who can inspire the players at the right time.

For Olympic and Asian Games the Manager should be one who has already proved his worth. Like the Coach the Manager should also not be changed too often.

The Manager should be appointed in consultation with the AICS.

Selection of the Captain

The Captain should be appointed on seniority-cum-merit basis. He should be one who has all-round

knowledge of the game and commands the respect of all the players.

He should be a player of repute and should have strong qualities of leadership. He should be one who can also act as a coach during the game or the match as he will have to carry out all the instructions given by the coach prior to the start of the match. His advice should be respected by the other players and he should be one who can instil a team spirit amongst the players and move them in a team.

The AICS has also defined the duties of a Coach, and the Manager of the team.

Hints for Players

All players who have reached a reasonable level of proficiency in the game expecting their inclusion in the probables for selecting a team for participation in International events, should keep themselves in perfect health and trim condition. They should devote a good time every day to follow the training schedule given to them by coaches concerned.

The players selected for coaching camps leading to the selection of the final team should make themselves available for such camps in time. In cases they find difficulty to be released by their employers well in time they should report the matter promptly to the National Federation concerned.

During the period of coaching camps the players should strictly follow the camp routine and training schedule and change their eating habits according to the instructions of their coach to prepare themselves for the kind of food they are expected to get during their visit abroad.

The players should fully cooperate with the Sports Physician for their medical check up and follow the advice/treatment prescribed by him. They should not conceal anything from the Sports Physician and voluntarily give him their medical history and also report to him even minor ailments, if any during the camp.

Once selected to represent the country they should ensure that their documents for visit abroad are ready in time and for this purpose they can seek the assistance of the Manager accompanying the team. They also should have their uniform and playing kit etc. stitched according to their measurements in time.

During competitions in the country and abroad they should show an outstanding behaviour on and off the field and should not do anything abroad which brings discredit to the country.

They should not give any statement to the Press, Radio or Television without the approval of the Manager and should not rush to the market for purchases before their last fixture in the competitions abroad is over.

In no case they should leave their place of stay abroad even for short intervals without the permission of the Manager. It is also desirable that they

go outside in a group accompanied by one of the officials accompanying the team.

General

All officials and members of the team going abroad must return to the country as a group after the completion of their tour abroad and should not break away from the team for visits to other countries to meet relatives.

The officials should generally abstain from discussing with the players their weak points during a match till after about 4 hours that particular match finishes. After the lapse of a few hours the officials and the players would be better prepared mentally, emotionally and otherwise to discuss this important matter.

There should not be any public criticism of the game by the Manager, Coach or the players and the players should abstain from criticising the policy of their Government at home or the Governments of other countries including the country being visited by them.

The officials and players should also abstain from criticising the arrangements for their stay and food and for the sports events in public. The Manager can however discuss the matter with the authorities concerned.

The members of the team going abroad must be fully acquainted with the conditions at home and also familiar with the community singing of the National Anthem. They should give full respect to the flag of the host country and of other countries participating in the event. ●●

Achievements of University Sportsmen

ATHLETICS

1. **Miss Kamaljit Sandhu**—Represented India in Asian Games, 1970 and won a Gold Medal. Awarded Padma Shri in 1970.

2. **Irene Saldanha**—National Champion in broad jump, 1972. Represented India in International Athletic Meet at Singapore in 1971. Member of the Indian Athletic Team for 1st Asian Athletic Meet at Manila, 1973.

BADMINTON

3. **P. Prakash**—National Champion. Awarded "Arjuna Award" for 1972.

CRICKET

4. **Mohinder Amarnath**—Ranji Trophy player, Represented India in some Test matches.

5. **Surinder Amarnath**—Ranji Trophy player.

HOCKEY

6. **Baldev Singh**—Represented India in the 1st World Cup Hockey Tournament at Barcelona, 1971 and II World Hockey Cup at Amsterdam, 1973.

7. **Rajwinder Singh**—Represented India in the 1st World Cup Hockey Tournament at Barcelona, 1971.

8. **Surjit Singh**—Represented India in the II World Hockey Cup at Amsterdam, 1973.

TENNIS

9. **Ilyas Ghouse**—Member of the Junior Tennis Team selected to play in Europe in 1973. Represented India in Universiad-73.

10. **Ashok Amritraj**—Represented India in Universiad-1973 and member of the Junior Team for the 1973 European Circuit. National Junior Champion, 1972.

WRESTLING

11. **Sudesh Kumar**—Represented India in Munich Olympics-72. Participated in the World Wrestling Meet at Tehran in 1973. Represented Universities in the Universiad-73 at Moscow, Arjuna Award winner 1971.

12. **Prem Nath**—Represented India in Munich Olympics, 1972. Arjuna Award winner 1972.

13. **Murari Lal**—Junior National Champion (Bharat Kumar—71).

14. **Raj Singh**—Represented India in World Junior Wrestling Championship at Tokyo, 1971. Member of the Indian wrestling team for Universiad-73.

ALIGARH MUSLIM UNIVERSITY ALIGARH

Advertisement No. 15/73-74

APPLICATIONS are invited on the prescribed form for the following posts:—

Candidates must possess Medical qualification included in 1st or 2nd Schedule of Part II of the third Schedule (Other than Licentiate qualifications) of the Indian Medical Council Act, 1956. Holders of educational qualifications included in Part II of the third Schedule should fulfil the condition stipulated in Section 13 (3) of the I.M.C. Act, 1956. Must possess a basic University or equivalent qualification entered in Schedules under State/Central Medical Registration Act. (For post at Sl. No. 1 only).

1. **Lecturers in Microbiology (J.N. Medical College) in the scale of Rs. 400-40-800-50-950 plus allowances.**

Qualifications:—Post-Graduate Degree in Microbiology, M.D., Ph.D., D.Sc., M.Sc., Speciality Board of Pathology (U.S.A.).

Or

M.D. (Medicine)/M.R.C.P./F.R.C.P. with D.B./D.C.P./D. Path./M.R.C.P. (with Microbiology as a special subject) or an equivalent qualification.

Desirable:—As Demonstrator in Microbiology, Registrar/Tutor or an equivalent post in Medicine for at least three years in a Medical College.

2. **Professor of Education. Scale Rs. 1100-50-1300-60-1600 plus allowances.**

Qualifications Ordinarily Required:—A first or high second class Master's Degree in Education of an Indian University or an equivalent qualification of a foreign University. Research Degree of Ph.D. Standard or published work of a high standard. Ten years' experience of teaching Post-graduate classes and guiding research.

Desirable:—Specialisation in any one of the following areas:—

Advanced Psychometrics, Child Development, Psychology of Learning, Educational Technology or Sociology of Education.

3. **Lecturer in Education (Women's College). Scale Rs. 400-40-800-50-900 plus allowances.**

Qualifications ordinarily required:—At least a first or high second class Master's Degree in Education of an Indian University or an equivalent foreign qualification.

Desirable:—Some experience of teaching the subject and/or Research work in Education.

Prescribed application forms and instructions may be had from the Deputy Registrar (Executive) by sending self-addressed envelope of 9"×4". Last date for receipt of applications is 20th January, 1974. Incomplete applications and those received late may not be considered.

Higher start may be given for special qualifications and experience. Candidates interviewed may be paid contribution towards their T.A. equal to one single second class Railway Fare only.

(P.V. George)

REGISTRAR

Issued by Public Relations Officer

UNIVERSITY OF INDORE, INDORE.

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No. Estt-III(9)/73

APPLICATIONS are invited for the following posts in the University Teaching Departments:—

Post	Department-wise No. of probable vacancies						
	Educ- tion	Busi- ness Manage- ment	Phy- sics	Maths	Statis- tics	Life Scien- ces	Chemi- stry
Professor	1	1	1	1	1	1	1
Reader	1	—	2	—	—	—	1
Lecturer	4	1	4	1	1	2	2

2. Qualifications and Pay Scales

(a) Professor: Rs. 1100-50-1300-60-1600.

(i) A first or second Class Master's degree of an Indian University or an equivalent qualification of a foreign University in the subject concerned.

Note: For Business Management Department the Concerned subjects would be Business Management or Administration/Industrial Engineering/Commerce/Economics. For Life Science Department it would be any branch of the Life Sciences.

(ii) Either a degree of the Doctorate standard or published work of high standard.

(iii) Not less than 10 years experience of post-graduate teaching and experience of successfully guiding research.

In the case of a candidate of exceptional merit the Executive Council may, on the recommendations of the Selection Committee and with the prior approval of the Kuladhipati, relax any of the qualifications mentioned in (i), (ii) & (iii) above.

(b) Reader: Rs. 700-50-1250.

(i) and (ii) Same as for Professor; with post-graduate teaching experience of

five years and three years experience of guiding research. Working knowledge of Hindi shall be a desirable qualification.

(c) Lecturer: Rs. 400-40-800-50-950.

Qualifications same as shown at 2(a)(i) for the post of Professor. A research degree in the subject or experience of teaching degree and/or post-graduate classes will be a desirable qualification. Knowledge of Hindi will be desirable.

3. The above scales carry with them dearness allowance and the benefit of Contributory Provident Fund in accordance with the rules of the University. A higher start can be given to deserving candidates.

4. If the candidates are not found suitable for a higher post, they can be considered for appointment on the lower post.

5. Applications should be made on a plain paper giving name, date of birth

particulars of academic career (from High/Higher Secondary School onwards), experience, published research work etc. along with a crossed Indian Postal Order of Rs. 7/- marked 'Payable to Registrar, University of Indore, Indore-1.' Applications should reach the undersigned not later than the 16th February 1974. The envelope should be marked "Application for the post of Department of.....".

Separate applications should be made for each post.

6. Candidates already in service should apply through proper channel. Candidates selected for interview will be required to travel at their own expenses. Those who have applied for the teaching posts in the Departments of Business Management and Education in response to the previous advertisements dated 6-12-1972 and 28-4-1973 respectively need not apply again but only intimate whether their applications be considered.

7. The number of posts can be increased or decreased according to requirements and sanction.

(M.L. Tiwari)

REGISTRAR

UNIVERSITY OF DELHI

Advt. No. Estab. IV/15/73

APPLICATIONS in the prescribed form are invited for the following posts:—

S. No.—Department—Designation

1. Buddhist Studies—One Professor.
2. Botany—One Professor.
3. Sociology—(i). One Professor.
(ii) One Reader (Temporary for the period ending 28-2-74 but is likely to continue. The post is under North East Hill Area Programme).
4. Commerce—One Professor.
5. Economics—One Reader
6. Hindi—Two Readers.
7. Mathematics—One Reader.
8. Urdu—One Reader (Temporary for the period ending 30-4-75).
9. Operational Research—One Reader.
10. Linguistics—One Reader.
11. Modern Indian Language—(i) One Reader in Marathi. (ii). One Lecturer in Panjabi.
12. Modern European Languages—One part-time Lecturer in German (purely temporary).
13. W.U.S. Health Centre—Two Medical Officers (male) (One permanent and the other temporary for the period ending 29.7.75).
14. Law Evening Centre No. 1—One Professional Junior (Library).
15. Central Office—Record Keeper.

The scales of pay of the posts are:—

1. Professor—Rs. 1101-50-1300-60-1600.
2. Reader—Rs. 700-50-1250.
3. Lecturer—Rs. 400-40-800-50-950
4. Medical Officer—Rs. 400-40-800-50-950-with Rs. 300/p.m. fixed N.P.A.
5. Professional Junior—Rs. 400-40-800-50-950.
6. Record Keeper—Rs. 210-425.

All posts carry D.A., C.C.A., H.R.A. and retirement benefits (in the case of permanent incumbents) as admissible under the rules in force from time to time.

I. Essential Qualifications

(a) For Professorship

A scholar of eminence

Independent published work of high standard and experience of teaching Post-Graduate classes and guiding research for a considerable period desirable.

(b) For Readership

Good academic record with first or high second class Master's Degree in the subject concerned with a Doctor's Degree or equivalent published work.

Independent published work (in addition to the published work mentioned above) with at least five years teaching experience in Honours/Post-Graduate classes essential.

(c) For Lectureship

Good academic record with a first or high second class Master's degree or an equivalent degree of a foreign University in the subject concerned.

(d) For Medical Officers

M.B., B.S. Degree from a recognised University. Minimum three years' experience after passing M.B., B.S. required. Candidates with Post-Graduate qualifications or hospital experience will be preferred.

(e) For Professional Junior

(i) First or high second class B.A./M.Sc./B.Com. Degree & First or high second class Master's Degree in Library Science.

OR

First or high second class M.A./M.Sc./M.Com Degree & First or high second class B.Lib. Science or First or High Second class Post-Graduate Diploma in Lib. Science.

(ii) At least two years experience in a Professional capacity in a Library of standing.

(f) For Record Keeper

A second class Degree of a recognised University with Diploma in Archives keeping.

II. Special/Desirable Qualifications

(i) For Professorship in Buddhist Studies

Should be proficient in Sanskrit and Pali and must have specialised in one or more of the following subjects:

(1) Buddhist Philosophy with all its divisions and schools. (2) Buddhist History and Culture (3) Buddhist Literature—Sanskrit and Pali. Knowledge of Tibetan and/or Chinese desirable.

(ii) For Professorship in Botany

Specialization in Structural and Development Botany.

(iii) For Readership in Economics

Master's Degree in Economics or Ph.D. in Economics in Economic Statistics.

(iv) For Readership in Urdu

Ability (i) to guide research at M. Litt and Ph.D. levels:

(ii) to conduct Post-M.A. specialised courses in translation and M. Litt in Urdu.

Special study of Nineteenth century Urdu prose.

(v) For Readership in Operational Research

Specialisation in one of the following topics:

(1) Inventory Control, (2) Theory of Queues, and (3) Theory of Marketing.

(vi) For Readership in Linguistics

Specialisation and research interest in Generative Grammar.

(vii) For Readership in Marathi

Knowledge of Sanskrit and Hindi and ability to teach in English for the M. Litt. Course for the Comparative Literature.

(viii) For Lectureship in Panjabi

Specialisation in Modern Literature and literary theory or Medieval Literature and Philosophy will be preferred.

(ix) For Professional Junior in the Law Library

LL.B. Degree and experience of working in a Law Library.

The prescribed application form for the posts can be had from the Information office of the University either personally or by sending a self-addressed envelope with postage stamps worth Rs. 1.45. The applications for the posts at Sr. Nos. 13, 14, and 15 may be made on plain paper.

Selected candidates will be required to produce the original documents relating to their age, qualifications, experience, etc. before joining the appointment.

Applications accompanied by attested copies of Degrees and other Certificates etc., should reach the undersigned not later than the 20th January, 1974.

NOTE:

1. It will be open to the University to consider the names of suitable candidates who may not have applied. Relaxation of any of the qualifications may be made in exceptional cases in respect of all posts on the recommendation of the Selection Committee.

2. Canvassing in any form by or on behalf of the candidate will disqualify.

3. Candidates called for interview from outside Delhi (Excepting for the posts to serial Nos. 13, 14 and 15) will be paid contribution towards their Railway Fare as per rules.

REGISTRAR.

UNIVERSITY OF DELHI

Advt. No. Estab. IV/16/73

APPLICATIONS are invited for the post of Registrar of the University.

Scale of Pay: Rs. 1100-50-1300-60-1600.

Unfurnished residential accommodation will be provided by the University for which rent will be charged at the usual rate. Conditions of service shall be embodied in the Agreement of Service. Leave, leave salary, allowances, Provident Fund and other benefits admissible, as prescribed in this behalf by the University from time to time for employees of the University.

The post carries D.A., H.R.A., C.C.A. and other allowances as admissible under the rules in force from time to time.

Qualifications: Essential—High academic qualifications including evidence of sustained intellectual interests. Experience of administration at the executive level.

Desirable: Experience of University administration and familiarity with the working of University bodies and institutions. Familiarity with methods of general financial control.

The prescribed application form can be had from the Information Office of the University, either personally or by sending a self-addressed envelope with postage stamps worth Rs. 1.45 to the undersigned.

Selected candidate will be required to produce original documents relating to his age, qualifications, experience, etc. before joining the appointment.

Applications, accompanied by attested copies of Degrees and other certificates etc., should reach the undersigned not later than the 20th January 1974.

NOTE: 1. Relaxation of any of the qualifications may be made in exceptional cases.

2. Canvassing in any form by or on behalf of the candidate will disqualify.

3. Candidates called for interview from outside Delhi will be paid contribution towards their railway fare as per rules.

(K.N. Thusu)

OFFG. REGISTRAR

(Continued from page 42)

3. Gulhati, Shashi K. Shear strength behaviour of compacted soils in the saturated and partially saturated states. I.I.T., Delhi.
4. Mathur, Bhagwat Swarup. Runoff hydrographs for uneven spatial distribution of rainfall. I.I.T., Delhi.
5. Raj, A.J. Paul. On estimation of Markov processes corrupted by white gaussian noise. I.I.T., Delhi.
6. Sitarama Sastry, G. Newer products of potential industrial value from fatty oils. Osmania University.

BIOLOGICAL SCIENCES

Biochemistry

1. Vijayagopalan, P. Carbohydrates in relation to atherosclerosis. University of Kerala.

Botany

1. Ahosk Kumar. Morphological studies in some families of the Geraniales. Meerut University.
2. Bhatt, Devavratia Chandrashanker. Structure and development of stomata in some gamopetalae. Sardar Patel University.
3. Billore, Suresh Kumar. Net primary production and energetics of grassland ecosystem at Ratlam (India). Vikram University.
4. Lamba, Lakhmi Chand. Anatomical and morphological studies of fruits and seeds of some oleiferous crucifers. Meerut University.
5. Mishra, Chander Maui. Primary productivity of a grassland ecosystem at Ujjain (India). Vikram University.
6. Nigam, Dinesh Chandra. Ecological studies of some common herbaceous annuals from Rewa (M.P.). Awadhesh Pratap Singh University.
7. Rajagopal, T. Flora of Hyderabad including a study of the foliar epidermal characters of the species as an aid to taxonomy. Osmania University.
8. Singhai, L.C. Studies in the Deccani intertrappean flora. Ravishankar University.
9. Tyagi, P.C. Studies in seed storage with reference to effects of moisture, temperature and mechanical damage on the viability of seeds of some millets and legumes in storage. Rajasthan University.
10. Venkateswara Rao P. Development and anatomical studies in *Cajanus cajan* (Linn) Mill sp. Sardar Patel University.
11. Vijay Shankar Singh. Grassland productivity of Panna (M.P.). Awadhesh Pratap Singh University.
12. Vyas, Suresh Chandra. A study of primary productivity and nutrient cycling in a lake. Vikram University.

Zoology

12. Banerjee, Somnath. Role of edaphic factors on the distribution of subterranean Oribatei (Acarina) of West Bengal, India with description of some new species of Oribatids. University of Burdwan.
2. George, Elizabeth Leela. Studies on the anatomy and biology of the estuarine bivalve *Musculista arcuata* Yamamoto and Habe. University of Kerala.
3. Magon, Vijay Kumar. Studies on the morpho-histology, physiology, histochemistry and biochemistry of the digestive system of a few birds. Meerut University.
4. Suriya Narayanan, H. Studies on certain aspects of physiology of some molluscs. University of Kerala.
5. Yadav, Bhup Narain. Studies on the adrenocortical system of fresh water teleost. Magadh University.

Agriculture

1. Bhandari, Anant Ram. Study of some characteristics of apple orchard soils of Simla District and their relationship with nutrient content of apple leaves. Punjab Agricultural University.

2. Chaturvedi, Surender Prasad. Dynamics of Zinc in soils and plants with particular reference to the soils of Kanpur District. Kanpur University.

3. Chaudhary, Bajrang Dass. Estimation of genetic parameters in barley (*Hordeum vulgare* L.) by the technique of diallel analysis and its modifications. Haryana Agricultural University.

4. Kuhad, Mohinder Singh. Characterization and classification of soils of different bio-climatic regions of Haryana. Haryana Agricultural University.

5. Pathak, Madan Mohan. Inheritance studies of some quantitative characters in brinjal (*Solanum melongena* L.). Kanpur University.

6. Sharma, Rishi Kumar. Studies in the pollen morphology of brassica and linum. Kanpur University.

7. Shukla, Parmeshwar. Behaviour of molybdenum in soils and plants. Kanpur University.

8. Tripathi, Satyanarayan. A study on characteristics of improved farm practices as related to rate and extent of adoption. Kanpur University.

1. Tyagi, Shiva Kumar. Genetics of certain yield and quality characters in *Gossypium hirsutum* L. Meerut University.

10. Varma, Surinder Kumar. Studies on the causes and control of flower bud and boll abscission in cotton (*Gossypium hirsutum* Linn). Haryana Agricultural University.

Veterinary Science

1. Ashrit, Krishna. Studies on penicillinase from *Staphylococcus aureus* of bovine mammary origin: Production, purification and genetic studies. University of Agricultural Sciences, Bangalore.

2. Gupta, Prem Chand. Prediction of the digestibility of forages at different stages of maturity by using chemical, in vitro and in vivo methods. Haryana Agricultural University.

SOCIAL SCIENCES

Political Science

1. Arora, B.D. Indian-Indonesian relations 1961-1967. Jawaharlal Nehru University.
2. Arora, Vijay Kumar. Lohia as a socialist in Indian politics. Kanpur University.
3. Choudhury, Usharanea. Development of municipal administration in Assam, 1850 to 1947. University of Gauhati.
4. Kapoor, Bina. The problem of linguistic states in India. Kanpur University.
5. Narayana. The attitude of the British Labour Party to India's demand for independence 1920-47. Jawaharlal Nehru University.
6. Roy, Gandhijee. Diplomacy in ancient India. Magadh University.
7. Shrivastava, Guru Saran Narayan. District administration in U.P. with special reference to Azamgarh District. Kanpur University.
8. Shrivastava, Rashima. Bharat mein rajya karyapalika: Sidhantik aur vyavaharik roop mein (Madhya Pradesh ke sandarbh mein). Vikram University.
9. Vijayavargiya, Prabha. A critical study of social legislation in Madhya Pradesh since independence. Vikram University.

Commerce & Economics

1. Bhardwaj, Lal Chand. Nutrition, food supply and economic development with special reference to the planned economy of India. Meerut University.
2. Gupta, Ved Narayan. A study of the agricultural credit policy of the Reserve Bank of India since Independence. Kanpur University.
3. Gupta, Dinanath Bhattachandra. Exports in a developing economy. A case study of India. M.S. University of Baroda.
4. Kaul, Asha. United States trade structure 1870-1950: A study of the effects of domestic market expansion on trade. Jawaharlal Nehru University.

5. Patel, Babubhai Bhaichand. The structure of inter-district, inter-sectoral and inter-industry wage differentials in Gujarat. M.S. University of Baroda.

6. Rajasundaram, G. Direct taxation in India. Annamalai University.

Education

1. Brij Pal Singh. An experimental study of formal and thematic prompts in a linear programme in geography on map reading for class VII. Meerut University.

2. Doctor, Ashma Nomanbhai. A study of the factors related to innovations and change in the secondary schools of Bulsar and Surat Districts. Sardar Patel University.

3. Sumathikutty, Amma, N. Science interests of high school pupils in Kerala and factors contributing to the development of these interests. University of Kerala.

Psychology

1. Paranjpe, Shrelekha Dattatraya. Problems of graduate employed women: A socio-psychological study and attitude survey. University of Poona.

2. Veeteshwar Prakash. A socio-psychological study of voting behaviour. Meerut University.

HUMANITIES

Philosophy

1. Chadha, Satish Chandra. Kant's theory of our knowledge of the external world. Meerut University.

2. Mohammad Abdur Rasheed. Islamic views on crime and punishment. Osmania University.

3. Pandit, Girdharilal. Language and factual significance with special reference to logical empiricism. Visva-Bharati.

4. Trivedi, Bhavana Purushottamdas. An examination of the concept of change with special reference to the philosophies of Bergson and Buddhism. University of Poona.

Music

1. Sen, Sharmistha. The string instruments of North India. Visva-Bharati.

Linguistics

1. Ravindran, P.N. Nominal composition in Malayalam: A generative-transformational approach. Annamalai University.

LITERATURE

English

1. Agnihotri, Gopi Nath. On the treatment of Indian life and problems in the novels of Mulk Raj Anand, Raja Rao and R. K. Narayan. Meerut University.

2. Khan, Faiyaz Ali. Complimentary couplets verse from Ben Jonson to Samuel Jonson. University of Rajasthan.

3. Lochan, Rajiva. D.G. Rossetti's imagery in relation to his central ideas. Meerut University.

Sanskrit

1. Jain, Rukmani. Hariwanshpuran: Ek sanskritik drishti. Ravi Shankar University.

2. Pandey, Bharti. Vishnu ke vyayapak swarup ka Sanskrit kavyon mein pratibimb. University of Rajasthan.

3. Pathak, Jayanarayan Ramkrishna. Shivismahapuram: Ek adhyayan. South Gujarat University.

4. Pathak, Manisha. Panini se Patanjali tak Sanskrit ka vikas: Tadwat pratyayo ke adhar per. Ravishankar University.

5. Sharma, Vishwanath. Shudrak ka Mrichhakatik: Ek alochanatmak adhyayan. University of Rajasthan.

6. Shukla, Chandra Kant. Mudrarakshasnatkasya shastriyaadhyayanam. K.S. Darbhanga Sanskrit University.

7. Sinha, Kalpika. A critical study of Anandavardhana's Dhavanyaloka. Visva-Bharati.

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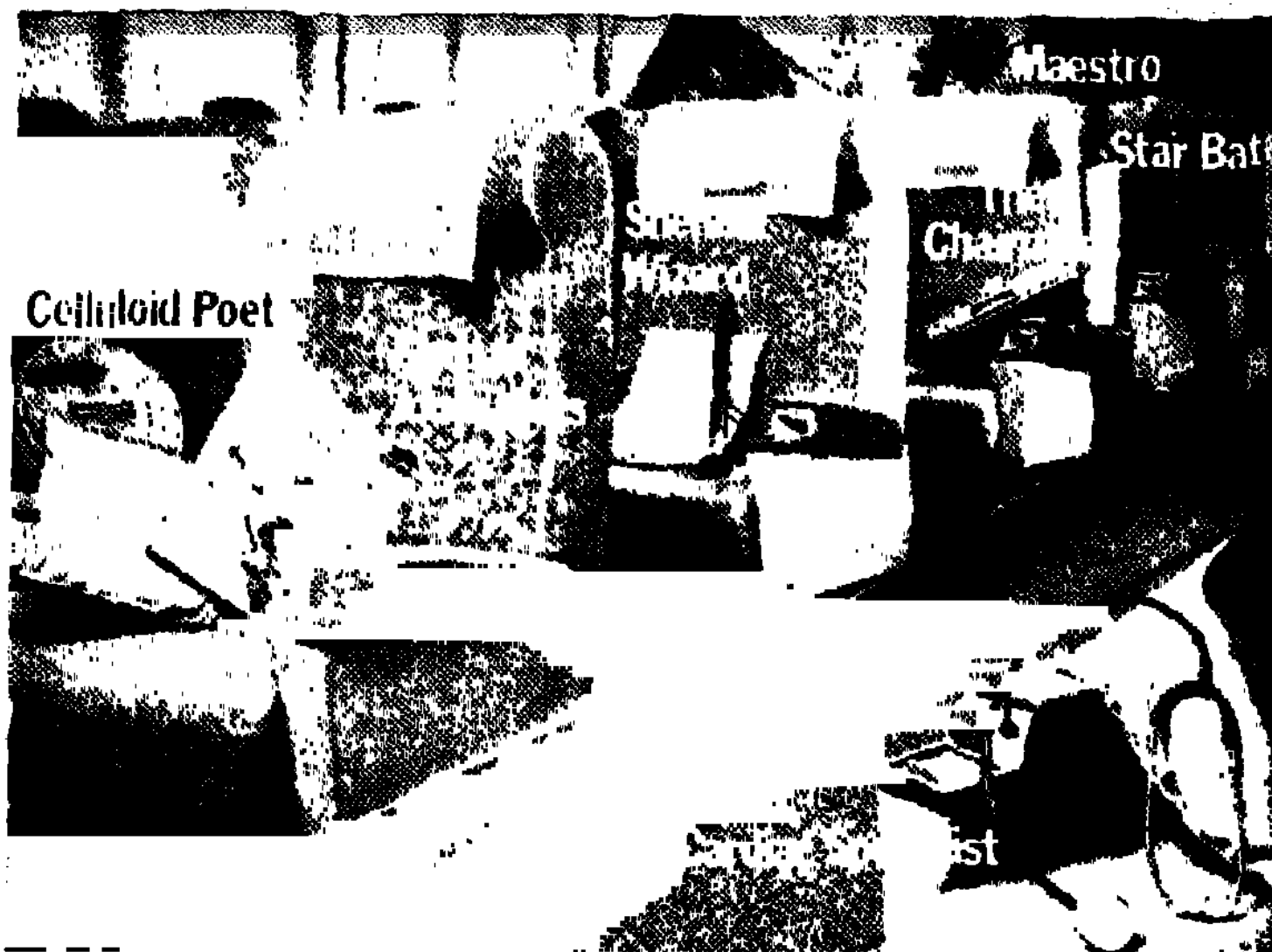
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UNIVERSITY NEWS

Vol. XII
No. 2



February
1974

A Monthly Chronicle of Higher Education

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Editor : ANJNI KUMAR

Ass. of Indian Universities to meet at Kharagpur

The 49th annual meeting of the Association of Indian Universities would be held this year on February 2 and 3, 1974 at Indian Institute of Technology, Kharagpur. Prof. S. Nurul Hasan, Minister of Education, Social Welfare and Culture, Government of India, would be inaugurating the session. This year in addition to the Vice-Chancellors, representatives of member universities are also expected to participate in group discussions on "National Service Scheme" and "Changing Pattern of University Constitution".

Sir Hugh Springer, Secretary-General, Association of Commonwealth Universities, London, would be in India during February and would be attending the session. Later on he will be visiting a number of Indian Universities. Besides, the representatives of the universities of Bangla Desh, Sri Lanka, Nepal, Afghanistan, Burma, and Association of Southeast Asian Institutions of Higher Learning, Bangkok have also been invited. As in previous years, the representatives from the Ministry of Education, University Grants Commission, National Council for Educational Research and Training, Indian Council of Agricultural Research and other organisations concerned with higher education in the country would also be present.

Amongst the various topics to be discussed at the annual meeting, there would be proposals regarding the exchange of teachers between different universities, the homogeneity of course contents of basic courses in a particular discipline in the universities and the standardisation of admission requirements of basic science graduates taking up postgraduate studies in agriculture in Indian Universities. The position of physical education personnel in the colleges and universities would also come up for consideration. The association would be finalising the various plans and programmes for the forthcoming Golden Jubilee Session.

The Research Cell of the Association has been established this year. Dr. H.N. Pandit and Shri H.S. Singha from the National Council of Educational Research and Training have joined as Project Officers on deputation. In the first instance, project studies on economics of higher education and examination reform would be taken up. Studies on other problems concerning higher education will be initiated subsequently.

Higher Education & Research In Australia

J. N. KAPUR

Though we are politically independent, we have not really become independent in our research. What we need is greater originality and courage in research, says the author who visited Australia recently.

THERE ARE 15 universities in Australia at present and three more are going to be started during the next three years. The number of students in a University varies from 1,500 to 18,000, though most of the Universities have between 5,000 to 10,000 students. The annual budget of a University varies from Rs. 5 crores to Rs. 30 crores and most of the Universities have their budgets between Rs. 10-20 crores. The number of books in the University libraries varies from 1 lakh to about 10 lakhs. The expenditure per student is roughly about Rs. 20,000 per year and is almost uniform all over the country except at the Institute of Advanced Studies in Australian National University which is a purely research organisation, where the expenditure per research student may come to about Rs. 75,000 per year.

As against this the expenditure per student in India comes to about Rs. 600. The number of students in a University may be as high as 2-3 lakhs. The number of books and journals in the libraries is much smaller. We have, however IITs, medical colleges, agricultural universities and some central universities where the expenditure per student is relatively high and may be as high as Rs. 5,000 to Rs 15,000 p.a.; yet the average expenditure is not at all comparable with the average expenditure in Australia.

Respect for Higher Education

There is fundamental belief in Australian society that quality of higher education is the indispensable means for developing human resources which will in turn enable the country to exploit its natural resources. Investment in higher education is considered to be the most profitable investment. Research in universities is regarded as vital for the progress of the nation. University professors are very often consulted by the Government on all important economic, social and scientific problems before it takes policy

decisions and the Government values the advice given. The large funds that are available to the Universities are mostly due to this philosophy about higher education which influences both the Government and the public.

In India, Universities do not get that respect. Political parties are prepared to exploit university students and teachers for their own ends and nobody is worried seriously if universities are closed for months together. There is little emphasis on quality of education and the Government depends more on the advice of its bureaucrats than on the advice of the University professors, though there are some exceptions. Many students come to the University not because they are interested in higher education but because they have nothing else to do. In the absence of full employment for graduates, there is lack of motivation on the part of the students and lack of commitment on the part of the teachers. Sometimes the atmosphere appears quite unrealistic and at places higher education looks more as a ritual than as a fundamental necessity for national prosperity.

Though there is a great deal of fundamental research in Australia and quite a number of Australians have won Noble Prizes, yet most of the research in Universities there is no significant national problems. Even in mathematics departments 40-50 per cent of thesis are written on problems of physical, oceanography, thermal pollution, operations research, computer mathematics, biomathematics, mathematics of mines and metallurgy, town-planning, river flows and so on.

Research in India is more often motivated by the desire to publish or to improve upon the research originating in western countries than by the needs of our own society. It is more difficult and requires greater originality to work on meaningful problems arising out of our own local and national needs than on extensions of research done in other countries; but unfortunate though we are politically indepen-

The author is the Vice-Chancellor of Meerut University.

dent, we have not really become independent in our research. We require greater originality and courage in our research work.

Australia does not have affiliated colleges like ours. It has about 100 autonomous colleges which determine their own admission policies and conduct their own examinations. They are not autonomous as far as curriculum making is concerned, but curricula are not decided by some central authority. The teachers in each college propose curricula in the light of the needs of the community in which the college is situated, and it has to be approved by the representatives of the community—representatives of business, industry, various professions and others—who decide whether the curricula are according to the needs of the society. All these colleges give what is called need-based education. In Australia, the phrase "job-oriented" education is not used because there is almost full employment and in addition about one lakh of persons are allowed to enter Australia from other countries to meet the needs of skilled workers of the industry there.

Part-time Courses

These colleges also offer part-time courses in the evening for improving the efficiency of workers in all walks of life and quite a large percentage of the working population attends these colleges for part-time courses for at least 2 hours a week. If an industry or a business group wants a specific type of training for its workers, the colleges are always ready to make the arrangements for the same. These colleges do not undertake academic research but are otherwise completely integrated with the life of the community. Some of these colleges are quite big and have budgets of Rs. 8-10 crores per year and may have three to five thousand full-time students and five to seven thousand part-time students.

In our country 85 per cent of the students study in affiliated colleges whose admission policies, examinations and syllabi are governed by central bodies. Few teachers of these colleges have any experience outside the college or the university and as such are not in a position to implement the policy of "job-oriented" courses about which there is so much talk. There are no members of the community associated with syllabi making. Though there are some members of the community associated with Executive Councils, and University Courts but their representation in academic bodies is insignificant.

Australian universities and state departments for continuing education cater on a large scale to the desire of the community for continuing education. Many Universities arrange hundreds of courses of 10-50 lectures each on various topics of interest to the adult citizens. These include courses on foreign languages, cooking, dress-making, secretarial practices, international politics, flora and fauna of Australia, pollution, sociology, religion and civilization.

Only 3-4 universities in India have made some efforts in continuing education. For the success of this effort, we need to create a climate in which a

sizeable part of the population will be interested in life-long education and even in paying for it and we need a massive effort on the part of the Universities which should feel that their responsibility for higher education extends to not only people in the age group 17-23, but they are responsible for the education of every body in the age group 17-70 or even possibly beyond.

Student Unrest

About three years ago there were agitations in most of the Universities on two main issues—one was the Vietnam war and the other was student participation. The first issue is now almost dead and the second was decided by giving students participation in all University bodies, including the Executive Council, faculties and the Academic Council. Usually the students have 5-10 per cent of the seats in these bodies. Their contribution has been on the whole quite healthy. At present there are no signs of student unrest.

The causes of student unrest in India are almost absent. Thus every University has a Union building, which may be 10-11 storeys high, containing canteen, indoor sports facilities, theatres, bookshops, banks etc. and Australian Students cannot complain of lack of physical amenities. The papers are always set by the teachers who teach them and therefore there is no question of papers being out of course. The answer books are returned to the students and so there is no question of partiality in evaluation. Every student is almost sure of employment and therefore there is full motivation for study.

Teachers get good salaries and promotions are usually decided by their colleagues on merit without outside interference. The criteria for promotion are usually objective in terms of publications and reputation as a teacher. Political parties have enough respect for the Universities and they do not exploit the Universities under any conditions. The gross inequalities in income which are so evident in India are not there in Australia. Leaving aside 20 per cent people who may be very rich or very poor; 80 per cent of the people have their ratio of income as 1:4.

Balanced Development

Australian Universities Commission has been given the responsibility of ensuring balanced development of all universities and as such the resources and standards of all Australian Universities are more or less comparable. Of course each University may have some departments of a very high standard and the Commission helps the University to develop these departments further, but then the centres of excellence are also evenly spread over all the Universities. The only exception is the Institute of Advanced Studies which is regarded as a national organisation.

The UGC in India has the responsibility of maintaining the central Universities and a major portion of its budget is spent on them. From the remaining, it has to help in the development of more than 80

Universities. Instead of ensuring the balanced development of Indian Universities, the UGC has become an instrument of producing inequalities in educational opportunities and in resources available to the Universities. The responsibility for maintaining the Central Universities should not be with the UGC, otherwise it is not possible for it to ensure the balanced development. The resources at the disposal of the various Universities should be the same and centres of excellence should also be distributed in all the Universities. The best policy would be to ask each state to contribute a certain percentage of its budget for higher education and the Central Government should also contribute a similar percentage. All these funds should be placed at the disposal of the central UGC which should distribute these funds equitably without making any distinction between Central and State Universities and in such a way as to ensure a balanced development of all Universities. An alternative method is to make higher education a Central subject and ask the States to concentrate all their resources on education upto the higher secondary level only.

Some Suggestions

Some suggestions for higher education and research in India in the light of the Australian experience.

(i) Every teacher in a college or a university should have a separate room for himself on the campus. There should be shelves for keeping books and each teacher should be expected to stay for about 8 hours a day in his office, studying and discussing with the students. At present every college has a large staff room where no serious work can be done with the result that teachers are not even inclined to stay in the college after their lectures are over. This reduces the student-teacher contact to a minimum. In Australia every teacher stays in his office from 8.30 a.m. to 5.0 p.m. and is available to the students in his office on appointment.

(ii) Every teacher should have a library of his own and he should be given books at heavily subsidised rates. The present tax exemption limit of Rs. 500 for books should also be raised to 10 per cent of the salary of a teacher.

(iii) There should be a mass production programme of books on a large scale in all languages and cheaper books, both for students and teachers, should be produced.

(iv) Universities should be encouraged to take continuing and adult education programmes on a large scale. Unemployed youngmen may be recruited for adult education work.

(v) No more affiliated colleges should be started. All new colleges should be autonomous community colleges. Even the existing colleges should be converted into autonomous community colleges in a phased manner. An autonomous community college should have the freedom regarding admissions and

examinations, but its curricula will be framed in consultation with the community it serves. The Central Government may take up the initiative in setting up a model community college in at least every division in the country on the same lines as it intends to set up model schools.

(vi) Students should be given representation in Faculties, Academic Councils and Executive Councils and should be made to feel responsibility to some extent for the educational system. Keeping them out of these bodies only encourages them to be irresponsible critics of the system.

(vii) There should be control on admissions according to the facilities available and every college should have a fixed number of seats which may be determined after considering all the facilities it has. About 60 per cent seats may be reserved for merit, 20 per cent for those whose parents did not receive higher education and 20 per cent for other weaker sections of society.

(viii) Strong steps should be taken to suppress corruption and nepotism in all walks of life for the sake of the moral health of the students.

(ix) Research grants to Universities should be considerably increased. We are spending about Rs. 200 crores on research and development in various national laboratories and other research organisations, but not even Rs. 10 crores per year are being spent on research in Universities. The Universities should be given specific research grants for buying costly equipment and a sum of Rs. 50 crores per year should be given to the Universities for research.

(x) Correspondence and Open University type education should be initiated on a large scale.

(xi) Steps should immediately be taken to ensure the balanced development of the Universities. Those universities and colleges which have suffered on account of inadequate resources should be given assistance on a more generous scale than those which have been receiving relatively more generous financial assistance during the past 1-2 decades. Certain minimum standards should be set for every college and University.

(xii) Higher education should be made a Central subject as soon as possible and national, rather than regional, policies should be pursued in this area.

The above schemes may cost about Rs. 500 crores during the next 5 years, but we may consider the alternative of not being able to provide the funds. The alternative will continue to be student unrest, unmotivated students, lack of purpose in higher education and this may also mean that more than Rs. 200 crores on higher education may be wasted every year. Another danger is that the student unrest may explode into undesirable avenues and may endanger the secular and democratic character of our country and this damage may be very serious indeed. ●●

NSS Activities in Higher Education Courses

MABUD HASAN

The National Service Scheme (NSS) was introduced in 1969-70 as a result of the recommendations of the Education Commission (1964-66) and the State Education Ministers Conference held in April, 1967. The overall objective of the National Service Scheme is to arouse the social consciousness among the university and college students and to provide them opportunities to be of service to the community while undergoing collegiate instruction. There is so much to be done anywhere and anytime in India that the area of NSS becomes almost limitless. The philosophy that should guide educational planners, pleads the author, is to so restructure University courses that participation by students (and teachers too) in community action programmes becomes a necessary component of instruction itself.

SINCE THE DAWN OF

independence in 1947, India has been witnessing an ever-increasing pressure in education. The ferment generated by impending political and social changes in the country created a new hunger for education. There was an all-round quest for new values and new levels of achievement.

The rush for education was reflected in the growth of Universities and enrolment of students during the last two decades. There were about 20 Universities in India at the time of Independence. At present there are more than 80, excluding about 10 institutions of higher learning which are known as 'deemed' Universities. Enrolment of students in the post-high school stages was about 300,000 in 1951. Two decades later, it stood at more than 3,100,000. The average increase in year-by-year growth of enrolment of students in the Universities, has been a little over 12 per cent. This phenomenal increase has by no means reached the saturation point, the optimum, required by the dynamics of national development and the magnitude of the numbers in schools and Junior secondary institutions, being estimated to be more than

10 million. Only limitations of financial and human resources and the uneven pace of growth in employment potential have kept the growth in check.

The question that immediately requires to be answered relates to the purpose and philosophy of higher education in India. These goals have not been clearly spelled out by official agencies. The National Education Commission (1964-65) defined the functions of Universities in very general terms.

However, three significant additions were made, namely: social service by students; work-oriented instructions; and responsibility of Universities to develop programmes of adult education and correspondence courses. Just as the Government has not been able to define in categorical and concrete terms the objectives of higher education and its role in national reconstruction, the people as a whole also are not very clear about the goals which they would like to set before institutions of higher learning. What is unmistakably obvious is the general urge to acquire higher levels of cultural and social development and the expectation that this can somehow be attained through education.

One reason why it has not been possible to regulate higher education in terms of consciously articulated philosophy of development, is that the legacy

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of the colonial past is too strong to permit radical departures. As is generally known, colonial rulers in India had used education for two broad purposes — to create a cultural elite in the country such as could be immune to the pressures of native needs and to bring into existence a human resource pool which could be utilised for exploitation of the masses. Consequently, Universities in India developed around them an air of insulated exclusiveness. The schism is still very deep and real.

Reinforcement of the divorce between Universities and aspirations of the community at large is provided by the large body of the administrative and teaching personnel who seem to be inextricably tied up with academic practices and ideas current in the West, particularly in the United Kingdom.

Dynamic approach

IN THE POST INDEPENDENCE

period, problems of educational reconstruction were reviewed by several commissions and committees. Emphasis on the development of science, technology and scientific research became noticable as a result of the deliberations of these reviewing bodies and the actions taken by the Government on their recommendations. Simultaneously attempts were made to bring about reforms in the structure of education, in the governance of educational institutions, in the examination practices and instructional devices.

One common shortcoming of all attempted reforms has been that these were segmental and atomistic, there being a consistent absence of social bias in all educational planning. The changes sought to be effected in the set-up were seldom related to the developmental needs of the country. Some of these shortcomings are now expected to be removed by further strengthening of the National Service Scheme (NSS).

The significance of National Service Scheme by students derives from:

- the role of higher education in national reconstruction
- the moral imperatives generated by the social context and
- the psychological need of having a sense of participation in national-building tasks.

Of all these three factors, while the second has always been receiving due importance under the impact of tradition (but which has seldom been fertile) the other two have begun to receive attention only recently. Sociological compulsions on education, the expectations of the community which pays for it at the rate of nearly Rs. 5,000 per graduate, the discontent among students and teachers with the roles thus far assigned to them, the general ferment among the youth and dissatisfaction born out of the fact of living with a decadent *status quo*, and above all the general growth of democratic awareness among the working masses — these elements of a contemporary

situation — have jointly and severally been exercising tremendous impact on the minds of those who have anything to do with education. There is very serious and urgent rethinking on the relevance of the goals of higher education, whatever they may be, to the all-important task of national regeneration. The practices in the Universities, handed down to us by tradition from colonial days, are being increasingly questioned.

Students do not regard themselves as mere students. They wish, and often manage, to mix with the people outside the campuses to make common cause of their own demands as well as those of other youths and the people in general. Popular masses no longer feel obliged to treat the Universities as sacrosanct defined temples of learning likely to be defiled by even the most elementary exposure to the community.

The establishment of National Service Corps (NSC) involving thousands of students of diverse cultural backgrounds and academic orientations, and its remarkable growth within the short span of a little more than three years, is indicative of a constructive urge motivating the student of today to find channels of self-involvement in the affairs of his society and to seek opportunities of fuller development of his personality. Even as one witnesses on the Indian scene intermittent student riots and acts of aggression offending the accepted norms of society, one is struck by the stable and continuous growth of the NSS movement. The National Service activity constitutes the only vehicle for students to channelise their energies for democratic action to reconstruct both education and the human environment. It is the most pregnant development that has come up on the Indian campuses and has within it catalytic potentialities bringing to fruition the long felt urgent reforms in education and ridding it of its colonial shackles.

During the first year of introduction of National Service a provision for enrolment of 40,000 students in 38 selected Universities and institutions was made. The target was nearly fulfilled.

In 1970-71 about 90,000 students enlisted themselves in the NSC and in the following year, there were around 1,20,000 students working under the scheme. It is proposed to involve atleast 10 per cent of students engaged in graduate studies in the NSS by the end of current Plan period. Besides students, about 2,000 teachers, roughly at the rate of one teacher for every 100 students, are to be directly concerned with the scheme.

The entire enrolment in the NSS is thus strictly voluntary, although methods of involving the total student mass and entire Universities along with their resources in community action programmes have been continually examined.

Two schools of thought have contended against each other. The first, for which stability and discipline were prime considerations held that NSS should be purely voluntary and selective, and enrolment should remain confined to graduate students. The other school would have liked to think of NSS as a

lever for changing the character of our Universities, and use educational institutions as instruments of social transformation. This school placed emphasis on regarding NSS as a movement rather than an aggregate of students brought together for some ad hoc common cause.

Out of the debate concerning the character and scope of the NSS the second school has emerged stronger. The Union Ministry of Education and Social Welfare has advised to integrate National Service with the courses of study. This means that the syllabi are to be so restructured that the entire educational effort becomes a vehicle of identifying the problems of social development, for fostering the requisite skills and orientations that can be brought to bear on their solution and, finally, for successfully tackling them in the quickest span of time.

The period minimally prescribed for service for the National Service volunteer is 120 hours per year. Since the volunteers enrol themselves, normally, for two years the total time works out to 240 hours. This factor is related to the character of NSS programmes. If the programmes are of longer duration the student does not have a sense of achievement. On the other hand, shorter duration programmes do not meet the needs of the community. The contradiction can be resolved by evolving appropriate community organisations and building up a non-student youth services movement. Both of these aspects are receiving urgent attention. The establishment of Nehru Youth Kendras in every district and the proposed institution of 20,000 volunteer corps comprising University-leaving graduate students are right steps in that direction.

The social activities in which the NSS students have been engaged according to their orientations, interests and convenience have been many. A detailed classification is not called for here. There is so much to be done *anywhere* and *anytime* in our country that the area of national service becomes almost limitless. No activity, however small, with a bearing on the improvement of the conditions of existence of the broad masses can be taken to be out of place. If one were to list the specific activities in which NSS volunteers got themselves engaged during the last three years, the number would cross hundred, although the same could be grouped in broad categories like general social education, attention to children. Youths and other sections of the community; rural extension; environmental improvement and social hygiene; sanitation and health care; casual campaign; etc.

It would be seen that involvement of thousands of students in diverse activities requires very complex and elaborate mechanisms of supervision and training. Policy determination is done at three levels; the National, State and the University level. At each of these levels there are appropriate committees. When policy decisions percolate to the level of NSS organisation within the University, the implementation is usually the task of the programme coordinator who is assisted by a team of teacher advisers and stu-

dent organisers. (There may be minor differences in the patterns adopted by the individual State/University). Supervision is exercised by the Programme Coordinator and his team as well the functionaries of the placement agencies. Again orientation and training are provided by specially designed classes under the charge of specialised institutions, through national camps periodically held in different parts of the country, and lastly, through short-term orientation sessions appropriate to each activity area at the University level. Out of the total of 240 hours roughly 40 hours are used for orientation of student leaders.

Two or three aspects need to be mentioned here in order to have a relatively satisfactory idea of the layout of the scheme. Placement of the student volunteer is done in three ways. He can be placed with a centre operated by the NSS, or with a social welfare agency active in the area. In the event neither of these two avenues of placement is found to be satisfactory, the student can go for self-placement in his hostel or area of residence. There he may take up an ameliorative project and seek the assistance of fellow students and members of the community willing to help him. He may also bring into effect such ad hoc or quasi-permanent organisations as are likely to be of help in the implementation and coordination of social service.

The supervisory staff falls into two categories. At the top are those who are concerned with keeping a check on implementation of policies and providing various kinds of facilities including release of grants. Supervision at the operational level is exercised by Programme Coordinator who is usually a senior University teacher. He is assisted by a group of teachers and students in his functions. In places there may be a whole-time Programme Coordinator not necessarily designated by that name always. Assistance in the implementation of projects and programmes worked out in the scheme are also available in the shape of secretarial hands, field assistants and some subordinate staff. The secretarial and subordinate staff is appointed on a full time basis and appropriate salaries commensurate with the emoluments drawn by similar hands are provided.

The goals

TWO SETS OF OBJECTIVE

have emerged in NSS. First, the primary objective issues form the task of integrating University education with the hopes and aspirations of the people. Second, the immediate and secondary object of the scheme is service to the community by students while undergoing instruction in an educational institution.

It is expected that work in pursuance of these objectives will arouse the social conscience of students, imbue them with a sense of social commitment and in the course of live contact with the people,

enable them to put the education they receive to social use.

Emphasis thus far has been laid on the secondary objective while some tangible results have been obtained the approach has not yielded advantages of a far-reaching and fundamental consequence. The practice of rendering social service voluntarily and under compulsions or personality predictions has been common in all societies and at all times. A more quantitative increase in the numbers engaged in this kind of service by itself does not lead to a qualitative improvement in the conditions of existence of the masses.

Such an approach always leaves regulating social institutions untouched and social change continues to follow an undirected, now gradual, now abrupt, spontaneous path. Universities primarily concerned as they are with culturing human intellect can legitimately aspire to direct social change along consciously determined lines.

The limitations of anchoring national service to the activities of individuals without disturbing the social institutions necessarily leads to shifting the focus from the secondary goals to the primary objectives. It is increasingly felt that far more radical steps would have to be undertaken than have been attempted hitherto. Courses should be so designed that participation by students (and teachers, too) in community action programmes becomes a necessary component of instruction itself. This is also essential if a change in the total outlook of educational administrators and academic bodies, favourable to social service is to be brought about. Conservation firmly rooted in the Universities permeates to government services on the one hand and engenders social attitudes among University graduates on the other. The hide-bound traditionalism of British liberal vintage has to be replaced by a dynamic radicalism with commitment for thorough-going national reconstruction.

Relating University curricula to the requirements of social transformation will entail a whole series of steps at national, State Governments level and above all, at the level of the University itself. The philosophy that should guide educational planners and national service functionaries is to restructure University courses around the problems of the society. Thus each discipline (department of study) should plan its curriculum with a view to identify, from its special point of view, the social problems that clamour for solution, cultivate the requisite skills to attack these problems and, from these two bases enhance the frontiers of human knowledge.

The second important step will be to effect co-ordination between the approaches of different disciplines since a good number of problems are likely to require simultaneous tackling by more than one academic discipline. The net result of these twin steps will lead to basic modification of study assignments. Class-room education, supplemented by laboratory experiences, will have to go hand in hand with field activity. For which purpose each University will have to select a segment of the social setting for field operations. Similarly, to be able to create an app-

ropriate climate for community-biased education, provide liaison between University departments and sections of the community, and, finally, oversee the execution of National Service activities as such, there may have to be a "Department or Bureau of Extension Work and Community Services" in each University.

Implications

THE CONCEPT OF NATIONAL

Service is increasingly receiving attention in the Universities all over the world. It is assuming proportions of a real mass movement in the developing countries, particularly those which have emancipated themselves from imperialist bondage after World War II and have a vast legacy of colonial background to erase. Experience of the work in these countries has demonstrated that the moral, economic and physiological dimensions of social service are not very productive from the long-term point of view. These approaches anchoring, respectively, on the ethical response to social pressures, the need to have work orientation in the course of studies and temperamental craving to be of help to others, have invariably placed emphasis on the individual and have tended to ignore the social reality. It is, therefore, appropriate that the focus should have shifted to the total human environment of which education is an integral part. It is this environment that is now sought to be transformed by using education as one of the chief instruments.

In the course of discussions pertaining to the problem of building the concept of national service within the curriculum and, concomitantly, integrating University education with social development, there were encountered considerable diffidence and skepticism. It is true that there are no readymade models in the field to be instantly adopted. In all situations where radical social changes are called for, there seldom exist any pretested innovatory practices; the people interested in change have always to devise bold steps and to improvise responses to recurring challenges. In India, ever since Independence, we have been talking of the need to transform our educational system but we have consistently lacked the courage to catch the bull by the horns and embark on a revolutionary plan of action. The principal malady has been the built-in puritanical academicism in the Universities. The University Grants Commission has only stood guard over this imbecility and has not taken any single significant step in annihilating the colonial anti-social character of education. The spate of "reforms" in the instructional practices, textual materials and evaluation devices have left this character altogether undisturbed.

Among the advocates of change, there are many who are still not very clear about how the curricular dimension of national service is to be developed. They would like specific illustrations to be worked out in respect of each discipline and some pilot ex-

perience before they fully get over their doubts. It is not possible here to take up each University discipline, one by one, and articulate detailed curricular specifications. That is a job which subject panels of the University Grants Commission, University departmental committees and the academic councils have to do. However, the method of structuring of courses of study on the basis of the contents of this or that book published in the Western countries should be replaced by one based on a study of the concrete conditions of our society. Identification of learning and teaching aids and assessment mechanisms are to follow later.

Nevertheless, it would be worthwhile to point out some cardinal directions which may help make University education socially meaningful and consistent with the new concept of national service. The starting point may be the selection of a segment of the social layout, preferably in the countryside, followed by a depth survey of the physical and cultural conditions.

Each discipline should plan and participate in this survey and seek to locate aspects qualifying for its specific differential attention. The tasks which the University will have to execute in this selected segment will fall under two categories-generalist and specialist.

The generalist plan of action does not need much elaboration. A majority of national service activities sponsored by the Universities over the past three years belong to this category. Assisting the village community in carrying out developmental plans by imparting adequate general knowledge and adopting the right type of social organisation, promoting nutritional programmes, population education, adult literacy, general sanitation, cooperation etc. are areas where generalist actions may operate. Casual campaigns like 'Youth Against Famine', 'Drive Against Want and Scarcity', 'Youths for National Integration' etc. are other examples. In the generalist programme of action teachers and students may participate freely irrespective of the discipline to which they belong. The only condition attaching to participation in this type of activity will be the presence of unfettered volitional option of the participating individual.

It is, however, the specialist plan of action that constitutes the main component of the curricular dimension of national service. Within a University the boards of studies are normally grouped in faculties or schools.

The broad groups can be identified as:

- The Behavioural and Social Sciences comprising such disciplines as Economics, Commerce, History, Political Science, Psychology, Pedagogy, Sociology and Law.
- The Humanities comprising Languages, Philosophy, Comparative Religion, Architecture, Fine Arts, Dramatics and Cinematography.
- The Life Sciences comprising Animal Husbandry, Botany, Ecology and Medicine.

Mid-Term Appraisal of NSS

A WORKING GROUP of experts set up by the Ministry of Education and Social Welfare in October, 1971, has carried out a mid-term appraisal of the National Service Scheme in Universities and colleges.

The report noted that in spite of initial administrative difficulties the National Service programme has made remarkable headway. The Working Group suggested that the syllabi in various subjects of study may be modified to include some aspects of social service, so that the student is able to develop a lively contact with the life of the people and become aware of their problems.

The group has also suggested certain measures to develop the National Service Scheme as a part-time voluntary activity by students and teachers in development programmes and welfare activities. Another important suggestion was that national service for a period of one year after graduation be made compulsory for all those who wish to take employment or go in for higher education.

The National Service Scheme is in operation in Universities and colleges in Assam, Andhra Pradesh, Bihar, Gujarat, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Karnataka, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal and Union Territories of Chandigarh and Delhi.

The Scheme aims at arousing the social consciousness among students and providing them with the opportunity to work with the people around the educational campuses creatively and constructively while studying in colleges—thereby putting the education they receive to concrete social use. During emergent situations there are special programmes under the Scheme, in which selected students undertake constructive work like in Bangla Desh Refugee Camps as well as in Youth Against Famine Camps.

The students who participate in the Scheme gain first-hand knowledge of the conditions prevailing among the masses, and help to improve their lot. They would also gain valuable experience of community service and this would help make them better citizens. As a result of work camps, useful and durable community assets are created.

—The Natural Sciences comprising Physics, Chemistry, Geology and Geography.

—The Tool Sciences comprising Engineering and Technology, Mathematics and Statistics.

Now for the purpose of designing action programmes, it is convenient to regard the community segment selected by a University as an experimental field. The myriad aspects of the nature of this field, as revealed by the depth, survey including complex patterns of social life, characteristics of the physical geographical setting, ecological and climatic conditions, flora and fauna etc. would provide the data for determining areas as may require a multi-disciplinary joint venture.

How mono-disciplinary or multi-disciplinary attention to these discovered areas can be given, is briefly illustrated below:

A. The Behavioural and Social Sciences: The discipline of Economics could study cost-benefit ratios of agricultural practices and help in the field of marketing and cooperation. The discipline of Commerce may supplement by studying the credit practices including banking facilities and the methods of keeping accounts of inputs and outputs. Psychology can help by focussing its attention on the group dynamics, motivational patterns, conflict resolution and public morale. Political Science may analyse political affairs of the people and integrate official administrative practices with the regulatory institutions of the community. Sociology could attend to the stability and flexibility of the social organisations and analyse differential conformity to social norms.

History can look after village revenue records and undertake preparation of village Gazeteers. Law and Jurisprudence could help in resolving local disputes and in cataloguing popular reactions to the various enactments of the Central and state legislatures. Pedagogy can attend to the social and general education of the community and assist the local school by supplementing their efforts and demonstrating new teaching methods.

B. The Humanities: Languages, particularly the classical and foreign ones may not directly fit in the scheme of campus community involvement. However an attempt can be made, specially by students of spoken regional languages to study word frequencies and help develop communication media out of school educational programmes. Philosophy and Comparative Religion can be instrumented in dissipating superstition and prejudice and in cementing bonds of brotherhood. Architecture can be instrumented in improving housing conditions and in the evolution and adoption of a rational and scientific habitation policy. The arts, the performing arts in particular, can address themselves to task of enriching the cultural life of the community and in arresting the corrosion of the folkways by hybrid cultural forms indulged in by the commercial agencies. The disaster of, intensifying mass alienation can be tackled effectively by the Humanities.

C. The Life Science: The Life Sciences can, as a group, help bring about the most appropriate ecological balance and maximal levels of social health. More concretely, Animal Husbandry can promote better breeding and rearing methods while Zoology can look after development of rural fisheries and poultry and take charge of pest control measures. Botany, including forestry can make itself responsible for re-afforestation and plant care and, in general, can help expand the frontiers of green revolution. Medicine may help establish and man community health clinics, supplement the resources of the primary health centres, undertake health surveys and concentrate on the improvement of environmental and preventive medicine campaigns.

D. The Natural Sciences: The overall task of Natural Sciences is improvement of the physical environment of man with a view to making it more comfortable and profitable. Specifically the disciplines in this group can, jointly and/or severally, take up programmes of soil and water analysis, control of erosion, salinity and alkalinity, and determination of regional suitability of various flora and fauna.

E. The Tool Sciences: Of the disciplines within this groups, Engineering and Technology can be most instrumental in securing community welfare. Building of village roads, bridges, water supplies and irrigation channels, development and care of agricultural tools and machines and evolution of scientific productivity practices can be some of its chief concerns. As for Mathematics and Statistics these may not be so helpful in the field but in the processing of data required in the field, their services can be directly relevant.

Even now there are many disciplines which organise field experiences like social surveys, topographical studies etc. It is undoubtedly so. But such programmes, discernible in the professional courses and the more 'applied' sciences, are invariably dictated to by the need to have a well balanced and rounded curriculum. They are predicated to an examination system which aims at mere award or acquisition of degrees and certificates. They never represented the response of a university to social pressures. Their prosecution is informed by a purely 'academic' bias. Considerations of community needs do not figure at all. Needless to say, such programmes have a marginal utility insofar as the social relevance of education is concerned.

The wholesale re-structuring of curricular specifications and assumption of social responsibilities by the Universities will necessitate the introduction of new, completely novel, instructional and evaluational methods. The purely textual lecture method of instruction will cease to have even the limited value that it has at the moment. Similarly, the external essay-type examination will become completely irrelevant. Which devices and mechanisms should be substituted for the existing ones should be carefully considered by expert bodies and widely discussed by academicians and other interested agencies. What is, however,

clear is the fact that the piece meal approaches to improve instruction and evaluation, initiated by the UGC and Universities at different times, are totally sterile.

Representing as they do peripheral attempts to reform a thoroughly moribund system, they will not produce any impact as long as the old structure remains qualitatively intact.

Again, the changes envisaged herein will call for the institution of a new scale of values to judge the merits of faculty members. The craze for initiative research studies 'worthy' of being printed in foreign journals has only served to reinforce the insular nature of our Universities. Recognition and promotion should come forth primarily on the basis of applied community oriented work.

A very important problem in effecting a decisive transition will be the need to bring about coordination between the resources of Universities, governmental agencies and social organisations. The attitude of 'academic detachment' nurtured on the campuses by the erstwhile colonial regime, is still strong and works as a very serious impediment. As pointed out earlier, a special department or bureau will have to be set up in each University to effect proper liaison with the community and Government and to bring about the new orientation in the value scales of the academic fraternity.

There is an opinion which concedes the validity of the projected shift but tends to doubt if it would really be practical in view of the managerial and financial difficulties involved in the change. It is said that drafting of over 3 million students in community action programmes will put a very big burden on the national budget, apart from the prohibitive responsibility of seconding an effective number of supervisors.

These difficulties are real only if existing pattern of NSS is to be retained. This is not justified. If Universities assume new social roles and if national service becomes a built-in requirement of the curriculum itself, the existing body of teachers will *ipso facto* become managers of the transition. Far from adding to the financial burdens of the Government, the change may actually represent some saving. For what is attempted to accomplish is merely *redefinition of the goals and functions of education*

General problems

THE MOST IMPORTANT

problem arises out of the sociological limitations of the Universities. A University is not an independent isolate; the factors making for progress and reforms are subject to the social-political pressures operating on it. Any forward action will be decided as much by its own dynamics as by whether there is a favourable climate in the country. Radical academic changes have therefore to await radical structural

changes within our society. We can only hope that the resolve of our people and parliament to build a socialist democracy will take early energetic shape, implying structural changes in all walks of life. Meanwhile, Universities (as other institutions) are expected to pull their weight and help accelerate the process of social transformation. The second problem concerns the need to secure sustained motivational levels in the implementation of the NSS. Students do not live in isolation from social milieu. There are constant irritants which exercise powerful impact on the students' minds and, irrespective of the climate in the University or in the NSS organisation, they get distracted. The most baffling of these irritants are unemployment and lack of social mobility.

Almost 60 per cent of graduates including those versed in professional courses, are without jobs. More than 30 per cent of the population is not engaged in any gainful occupation. A solution, though not totally comprehensive of this problem of motivation, may lie in the attempt to integrate University education including study-service activities with the social roles which students have to assume.

The third problem relates to the intra-University climate. Not all the faculty members are equally interested in the new movement symbolised by the NSS. A good number of features within each University militate against the ideals which students have internalized. Solution to this difficulty may again have to be found in the broader context of visualising Universities as social institutions which can be improved only in the measures as other institutions improved.

The fourth difficulty comes out of aberrations of the developmental sequences itself. Backward countries embarking on the path of change and progress invariably pass through a phase of corruption, selfishness, rush after personal comforts, nepotism, bureaucratism and a variety of similar evils. Naturally, these phenomena lead to frustrations which in turn lead to agitations and which again result in part-repression and part-fulfilment. The student of today, being a keen witness of the developmental scene, is usually affected by the deleterious influence around him and, consequently, his activity level deteriorates and suffers in efficiency. By providing proper orientation to students on the one hand and by letting them sort out the social reality of other citizens may on the other, will help obviate this difficulty to a considerable extent.

The last difficulty is related to the total dynamic field where an individual student feels himself left out from the vast movement of change and progress that is in gear directly under his nose. The problem becomes acute when big changes are sought to be effected through purely administrative measures and the democratic masses are regarded as either mute spectators or more followers on. It would, therefore, be necessary to involve the students in all stages of educational and environmental reconstructions, right from the state of planning down to the stage of execution and finally of evaluation. ●●

University Constitutions

THE MAJORITY of the Universities in India are of the affiliating type, modelled on the Medieval Universities in Europe and especially those of United Kingdom. This pattern of University served their purpose more or less successfully at the time they were formed but, with the modern developments have become archaic. There is a tendency to have more and more Universities to look after specific interests like the Universities of Agricultural Sciences or Institutes of Technology, which are deemed Universities. There are also a number of Unitary and Federal types of Universities in the country. Their numbers are likely to increase. My discussion on the changing pattern of University constitution will be based on a University like that of Calicut and may be not quite relevant in other instances.

The constitutions of the Universities must be drastically changed to make themselves relevant to the modern times and the future. However, commissions and other bodies appointed for the purpose are unwilling to bring about such drastic changes, for fear of upsetting the existing forms and methods of education. We have tended to think that the ultimate ideal can be achieved, by slow evolutionary measures, changing one or two items at a time. Unfortunately this is not so and it would appear that we have to change the system as such, giving up some of our traditions of University administration. Such a drastic change requires a whole new appraisal of the role of the various bodies and authorities.

The present University constitutions are such that no quick changes can be brought about. Any change suggested will have to be analysed and decided upon by a large number of bodies before final decisions can be taken and this may take anything like two or three years. This was a built-in mechanism to prevent wild ideas being tried out quickly by any particular group of persons but it is unsuitable in the fast moving world of today. With people all over the world questioning the earlier values in education system and their relevance to today's needs, it has become essential that the Universities change themselves. It is also necessary to ensure that sufficiently rapid changes are brought about.

While almost all Universities have very large number of powers written into their constitutions, very few of those are being exercised or can be exercised in the present day. These limitations are due to a number of causes including the developments in the political, social, economic and physical fields and by the powerful organisations of the students, teachers and employees of the University. Even though the University had been conferred powers, there is no machinery by which the Universities can exercise many of such powers conferred upon them because of a large number of counter forces and have often to look on

A Time For Change

C. M. FRANCIS

Can our Universities fulfil all their obligations in their present set up? The author pleads for a change in university constitutions.

helplessly. There is also a greater tendency for the State Governments to assume more directive powers which often become mandatory. Interference from Government should be removed.

The officers of the University are usually a Vice-Chancellor, the Pro-Vice-Chancellor and the Registrar. With the development of the Universities of the large affiliating type and development of the functions of teaching and examining it has become necessary to have a strong machinery for the examinations. Hence a large number of Universities have now another officer, the Controller of Examinations, who has almost

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equal powers to that of the Registrar and report directly to the Vice-Chancellor.

The financial dealings of the Universities have also increased enormously and it has become necessary to have a Financial Officer or Bursar who is also of similar status as the Registrar or the Controller of Examinations.

Vice-Chancellors

With the development of the Universities the Vice-Chancellor is not in a position by himself to plan the development of the University and to look after the routine duties of administration of the University and therefore there is need for full time officers to help him in the routine duties so that the Vice-Chancellor can devote more time towards the planning and development of the University. The appointment of one or more Pro-Vice-Chancellors, depending on the size of the University, is therefore very necessary; he must be appointed in consultation with the Vice-Chancellor. A greater amount of delegation of powers to the Officers of the University seems to be necessary in order to have the University function more efficiently.

The authorities of the Universities are the Syndicate or its equivalent, the Senate or its equivalent, the Academic Council, the Faculties and the Boards of Studies. There will be, in addition, a Finance Committee to look into the financial position of the University including audit, and development committees for the more efficient functioning of the University.

The Senate or its equivalent in many Universities is the highest authority in the University and looks after usually the administrative aspects of the University. The membership of the Senate has been changing and there is great demand by various groups of students, teachers and public for greater representation, since it is the body which is mainly concerned with the administration of the University. Kerala University was the first to include student representatives in the Senate. This is sure to be followed by other Universities, when their constitutions are changed. The proposed university Acts for Kerala and Calicut Universities include representation by students. Participation by students in the affairs of the University is to be welcomed and, if this participation is to be effective and responsible, it is necessary that there must be sufficient number of students in the Senate. The students must form at least 1/10 of the total number in the Senate. Such representation by a fairly large number of students is necessary:

- (i) to give an effective voice in moulding the policies of the University,
- (ii) to make it possible for various groups and types of students to be represented in the Senate and
- (iii) to make decisions of the Senate involving all the students so that such decisions can be implemented.

Another organised group which is represented in the University Senate and is asking for greater representation are the teachers in the University and in the affiliated institutions. Participation by the teachers is necessary and there is need for adequate representation of the teachers in the Senate. However care has to be taken in framing the constitution to ensure that the representation of the teachers is not under the control of one particular group having allegiance to one or other political group. The tendency today is to reduce representation by the Principals of the colleges, because the Principals, being part of the establishment, are considered often to stand against progress and change. Reduction in the proportion of Principals, however, is not a healthy sign.

The Principals of Colleges are people with considerable educational and administrative experience and they would be in a position to contribute effectively to the better running of the University and also their participation in the Senate and other bodies would lead to better implementation of the policies of the University. There is a growing tendency to increase the number of representatives from the general public. Participation by academically oriented men and women in public life is to be welcomed; if it is limited to elected representatives of the people in assemblies and local bodies and also members of the trade union, irrespective of their aptitude and experience, such representations will be harmful. It will be difficult to keep up academic standards and ideals if the non-academic people out-number the academic persons. The tendency to have only elected representatives doing away with nominated persons in the Senate is on the increase while this procedure follows the democratic traditions, it can lead to inefficient function as persons who are in a position to contribute to the successful running of the University may not be inclined to stand for elections.

Academic Council

The Academic Council or its equivalent is the main body having control and general regulations regarding courses of studies, syllabi and curricula, prescription of qualifications for teachers, equivalence of degrees etc., The Academic Council very often runs into difficulties and also stands in the way of implementation of new ideas by any one faculty. In the case of policy matters, there may be conflict with ideas of the Senate even though it may be stated that the Academic Council is the supreme body in Academic matters. In the case of one faculty alone wanting to try new methods, the academic council may reject it solely on the basis that the other faculties are not in favour of this new idea. It is therefore suggested that the Academic Council be abolished and thereby a single body, the Senate should deal with the administration and academic matters. The Senate should have a majority of academic persons (teachers and students).

The Faculties and Boards of Studies as constituted today contain senior persons in the subject. This has certain advantages as well as drawbacks. In every person, there are two opposing factors, a sense of security and a spirit of adventure.

The older persons are more likely to play for security. This need not be true always but the older man is usually afraid of trying new things and lose face if the new venture does not succeed. The younger persons with a sense of adventure may be able to contribute to the introduction of innovation. With the need for diversifying the courses of study and trying new methods of education and learning, and institution of new courses of study which include those whose components will include a major part of learning outside the conventional educational institutions, it would be worthwhile to see that the constitution of these bodies viz., Faculty and Board of Studies, is so altered as to have at least 50 per cent of the members below the age of 40 years.

Functioning of Syndicate

The Syndicate as it is constituted today is not in a position to discharge its duties effectively. It cannot be expected that the Syndicate which meets once a month can decide on policies and even the routine running of the University. It is also wrong to hold them responsible for any mistake made by the University officials. It cannot be expected that members of the Syndicate who are busy in their primary duties will devote sufficient attention to the administration of the University. The analogy between the assembly and the cabinet does not hold good because the members of the Syndicate are derived from many different groups. It is therefore suggested that the officers of the University, the Vice-Chancellor, the Pro-Vice-Chancellor, Registrar, Controller of Examinations, Finance Officer and others be entrusted with this work and may be helped by a standing committee of the Senate where some decision has to be made on questions of policy.

The powers of the Vice-Chancellor and other officers must be enhanced. It is ridiculous to limit the financial powers e.g. of the Vice-Chancellor to Rs. 5000 when even Heads of Departments in the Government have financial powers of Rs. 1 or 2 lakhs. No limit need be placed on the financial powers of the Vice-Chancellor, the limitation being that placed by the budget. Similarly, in the case of other officers also, there must be more devolution of financial, administrative, disciplinary and other powers.

There is a growing tendency throughout the world to make education, the responsibility of the State. This is and should be. With the majority of the institutions affiliated to the University being under the control of the Government, the Government will be in a position to dictate terms to the University as to how the University should run and this influence of the Government is likely to be brought in through the annual financial grants, maintenance and plan. This constant threat must be removed and it can be done if each State has a University Grants Committee consisting of Educators who can decide well in advance the grant to be given to each University and also periodically review the requirements and it must be binding on the Government to implement these recommendations. ●●

Indo-American Scholars Meet

Ever-increasing Scope for Co-operation

ACADEMIC EXCHANGES between India and the U.S.A. could be more meaningful if American doctoral scholars were attached to Indian institutions and worked under Indian supervisors, said Prof. Nural Hasan, Union Education Minister, while addressing the four-day conference of distinguished American and Indian scholars held in New Delhi recently. The meet was organised by the University Grants Commission and the U.S. Educational Foundation in India. The delegations were led by Dr. George Jacob, Chairman, University Grants Commission and Dr. Fred H. Harrington, Programme Adviser, Ford Foundation, New Delhi and Research Professor of History at University of Wisconsin, Madison.

Prof. Hasan pleaded that due weight should be given to the report of the Indian supervisors by the University concerned in America, while evaluating the work done by its scholars in this country. He expressed the hope that the conference would help in evolving a mechanism for academic exchanges to the advantage of both the countries. The scope for co-operation between the two countries in selecting areas of research and training was ever-increasing, he added.

The U.S. Ambassador, Mr. Daniel Moynihan said that Indians formed the largest group of foreign students in his country. The flow of American scholars to India, though not as large, was not inconsiderable. He hoped the conference would lead to increased co-operation between India and the U.S.

The U.G.C. Chairman, Dr. George Jacob, said earlier that both in the US and India the academicians enjoyed a large measure of freedom for investigation. All the same, there were sensitive areas and problems

which might have more than academic significance. Leaving them aside, it should be possible for scholars of the two countries to find wide areas for cooperation and collaboration.

Fifteen scholars from India and 12 from the US participated in the four-day conference.

Academic Exchanges

The meeting considered the present state of academic exchanges and research involving students, scholars and institutions in India and America, how to increase collaborative efforts between the academic communities of the two countries, and to bring these efforts to focus upon mutually interesting and valuable endeavours.

The chief topics for discussions were: relevance, national needs and policies, and the possible conflict of such aims with the scholar's general objective to extend and expand the store of knowledge. However, in the talks within the subject area groups there was little difficulty in arriving at agreements at the conference distinguished by a full, free and cordial exchange of views across the table and in many private conversations.

There is a lengthy record of interaction involving students, scholars, universities, and research institutions of the two countries, and many public and private channels already exist to facilitate this. The expectation at the conference was that many of the channels will continue to be utilised, although there may be more effort than in the past to give highest priority to those areas clearly reflecting *both* Indian and American needs and academic interests. In addition, it was agreed that wherever possible collaborative research and training programmes in both countries would be the favoured means for promoting such interaction and, where appropriate, interdisciplinary research should be encouraged.

For two days the delegates engaged in a general discussion of the academic and research needs and interests of the two countries. On the third day two groups were formed to focus specifically on the areas of science and technology and of social sciences and humanities, and a third group considered several wider policy matters affecting future academic exchanges between India and the United States. The recommendations and conclusions of these three groups were discussed and amended at a final meeting of the two delegations, and are summarized as follows:

Recognising the past, present and future value of cooperation and collaboration between India and the United States in many science fields, and the benefits which have accrued both to individual scientists and to the scientific disciplines in both countries as a result of such cooperation, the conference recommended that steps be taken to continue and expand this cooperation and to channel it into areas of mutual interest and need.

It was agreed that the pursuit of such objectives would be best served through projects involving in-

dividuals and institutions in both countries and planned on the basis of:

- (1) mutual national needs or scholarly interests, and
- (2) availability of expertise and facilities in specific fields in either country. In addition, research projects judged of value and proposed by individual investigators should also be encouraged.

In the near future, it was agreed, smaller and more specialized binational groups should assess our recent and on-going scientific research and educational programmes. The list projects recommended should also be reviewed and it be expanded by later working groups, as not all science and technology disciplines were represented in the conference delegation.

Biological & Medical Sciences

The following areas were suggested for attention (not arranged in order of priority):

1. Reproductive biology and fertility control.
2. Reproductive biology, animal and plant productivity, and biological control.
3. Conservation of plant and animal resources (including animal ethology).
4. Post-harvest technology; including food processing, storage and transport.
5. Communicable diseases (including immunological aspects, e.g. leprosy).
6. Nutrition
7. Microbiology; with special reference to fermentation, soil enrichment, and genetics.
8. Genetics.
9. Neurobiology (including brain research) and neuroendocrinology.
10. Health manpower development and utilisation, including "brain drain".
11. Water resources.
12. Pest management.
13. Primate biology.

Physical and Earth Sciences

- 1 Energy Studies:
 - (a) High energy chemicals, including conversion of coal for energy uses.
 - (b) Alternate sources of energy: solar, wind, nuclear and geothermal.
- 2 Materials Science: mettalic, non-mettalic and composites; techniques for handling and using.
- 3 Resources: water (including augmentation and biological aspects), soil, mineral, forest, oil and ocean.

Computer Sciences

Process design, simulation and control.
Environmental sciences (biological, meteorological, ecological, rural and urban planning).
Instrumentation science.
Space science and satellite technology
Information and communication systems.
Transportation systems.
Astrophysics, Astronomy and Radio-astronomy.

For its implementation the conference made the following recommendations:

Small binational seminars, beginning as soon as possible with somewhat broader working groups in areas such as reproductive biology, nutrition, thin-film technology and coal conversion for energy, to identify specific projects for collaboration.

Post-doctoral fellowships and graduate fellowships in selected areas of interest between the two countries, and involving standard academic relations between the fellow and the sponsoring or supervising professor.

Research collaboration between institutions with similar programmes, including provision for travel and short or extended visits.

Social Sciences

The need for certain guidelines in respect to research subjects, types of scholars and sources of funds was mentioned by the Indian members. The conference stressed that research requirements and resources in the two countries are vastly different, and the need to take steps against undue encroachments in a competitive situation marked by unequal resources was pointed out.

The American scholars expressed their general agreement with the research requirements and academic perspectives of Indian scholars. They felt that it was the responsibility of Indian authorities to make decisions about the acceptability of any given proposal.

The following list, incorporating suggestions by both Indian and American participants, and representing subjects appropriate and relevant to the exchange of scholars between the two countries and suitable for either individual or collaborative study or research was drawn up. The list of recommended areas should be reviewed and it is hoped to be expanded by later working groups.

1. Studies of Indian and American civilization and culture, including language and literature.

2. Quantitative methods and techniques in social sciences; including econometrics, survey research techniques and methods

3. International trade, international finance and currency.

4. Urban studies and planning.

5. Comparative study of political and legal processes and systems.

6. Comparative social structures.

7. Library management, library science and documentation.

8. Education, Educational Technology and teaching materials; including comparative studies of the effects of culture on memory, cognitive development, perception, and learning.

9. Museology.

10. Musicology.

11. Linguistics—Socio-Linguistics.

12. Social Ecology.

Regarding its implementation it suggested:

Commencing as soon as possible small binational seminars, possibly of an interdisciplinary nature, in broad areas such as quantitative methods and urban studies meet to identify specific projects for collaboration.

Post-doctoral fellowships and graduate fellowships in selected areas of interest between the two countries, and involving standard academic relations between the fellow and the sponsoring or supervising professor.

Research collaboration between institutions with similar programmes, including provision for travel and short or extended visits.

It was agreed at the conference that a specialist Advisory Group should be organised in the United States to inform the academic community there on areas of fruitful academic cooperation arising out of these discussions. The UGC should set up a similar Advisory Group in India for the same purpose. As the academic communities become acquainted with the facilities available in each country, the Groups could assist scholars in choosing areas of research and training beneficial to them and relevant to the needs of their country.

Academic exchanges are more productive when doctoral candidates and post-Ph.D. fellows are attached to universities or other educational institutions and work under the guidance of supervisors or other consultants. Reports of doctoral candidate's supervisor should be given due weight by the student's home university. Such attachment and supervision should not be insisted upon in the case of senior scholars.

Scholars engaged in field work in either country should be expected to give a copy of their data to the designated agencies with sufficient safeguard to protect the interests of the scholars who collect the data.

While the need for academic and research exchanges was emphasised, Indian members noted a preference for post-doctoral scholars to be sent from India to the U.S.; while the American members wished to send both doctoral students and other scholars to India.

The value of orientation programmes was noted. Sending and receiving countries should be encouraged to provide such programmes for the students they sponsor.

The principle of cost sharing the exchange of scholars was agreed to. Suitable procedures would have to be developed.

The question of Indian scholars remaining in the U.S. after completing studies was also discussed by the conference. The desirability of changing present visa regulations in this regard so as to reduce the number of such scholars was discussed and left for further examination by the appropriate authorities.

As cooperative endeavours continue to develop between academic communities in the two countries, additional support for exchange programmes and collaborative research should be made available. ●●

Examination Reforms

M. V. NAYUDU

Recently the U.G.C. published a plan of action for examination reform (briefly reported in our January 1974 issue) in respect of objectives of teaching and consequently of evaluation, question bank, internal assessment, and marks and grades. The author discusses these, in certain perspectives.

KNOWLEDGE AND information can be two different entities, the former involving an understanding of all possible aspects of the available information, while the latter may merely, relate to marshalling of facts. This naturally involves two aspects of a students' mental faculties. One relating to remembrance of facts read, and the other to association of facts in sequences, and their evaluation—in other words thinking of and understanding the facts or information. A student may be good in either one of them, good in one and not so good in the other, or good in both or good in neither. Any teacher would come across these various types among his students.

It is obvious that a student good in both remembrance and thinking and understanding of facts, is the best and the ideal student. He is likely to be the most creative. It is equally obvious that every man cannot do everything, more so in the present days when scientific knowledge is increasing at a very fast pace. It is, however, also true that a man does not remain static in his mental abilities and the acquisition of interests. It otherwise means that an individual can be appropriately and sympathetically guided to develop those abilities most useful to himself and the society he lives in. Since it is as a student that a man spends his formative years in formal learning and equipping himself for his later life, he should also be examined and guided correctly during this period of his life.

The present system of examining students at higher levels of education is largely by essay type questions set at the end of a year or two to three of formal studies. The student has often a hundred per cent choice in the questions to be answered in a 3-hour period. Hence many students gamble with omis-

sion of syllabi and study just before the examination period. These conditions merely lead to the testing of one's ability to remember a small information over a short period.

Can this system be called testing of one's knowledge? Would the student ever profit by such knowledge? If the answer is negative for these questions, what else can be done to satisfy these ends?

Often we hear about objective questions. Many consider that these questions involve more mentioning of yes or no, or choosing the right word out of a choice of 2 or 3 words, or filling in the blanks. This type of question certainly helps a quicker evaluation of an answer script. This, however, involves the mere remembrance of facts on the part of a student, not his thinking ability.

Conventional View

If we consider the evolution of a student from his first standard to his collegiate level, it involves first a learning of some facts. Subsequently it leads to a gradual association of facts to give a coherent idea of an objective, and finally to an evaluation of the series of facts of information, wherein the student's ability to think and judge is involved. These involve four out of nine criteria mentioned by the UGC. The other five criteria need entirely different individual procedures of testing and evaluation.

Thus the conventional view of objective questions holds good in the earlier stages of one's education. With time the student should, however, learn to express himself coherently and eventually demonstrate his ability to think of and judge the information. It thus becomes necessary that even in the latter stages of high school itself there has to be a method of

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not skip parts of syllabi, and that he is graded according to his actual varied mental ability.

Teacher's Role

At present the working of questions is not specific so that individual students differ in the quantitative and to some degree in the qualitative aspects of the answer they write. Since the evaluating teachers are different from the question setter in the present system, the former vary in their individual standards of evaluation. The victim is the student. Because of the specific time, answer and mark interrelated concept in the above pattern the student knows that evaluation will be objective and is not subject to the above vagaries.

As a further safeguard, the teachers concerned in teaching the subjects should formulate model questions on the above pattern and also furnish answers. The University should furnish these to the question setter so that he has a clear idea of the quality and quantity of answer he should expect from a student within the specified time for each question type. He would then accordingly, carefully formulate the questions. Thus this pattern can be implemented even in the present system as an improvement over the present evaluation standards. The students also should have access to such model question paper and model answer, and the concerned teachers should have used them at least at the terminal tests.

Internal Evaluation

We also hear frequently of the desirability of internal assessment and the use of tests of objective questions, quiz and assignments. Here again the pattern outlined earlier can be followed, varying the total

3. Type (a) question can be answered in approximately 5 minutes.

Type (c) question can be answered in approximately 30 minutes.

"We changed the syllabus again to discover it was what we had three years back."

Thus, this pattern ensures that the student does

number of questions in respect of total time allotted for the individual tests. For instance the biweekly or monthly tests can be of an hour duration while the terminal tests can be of 3-hour duration, and accordingly vary the number of questions only for each type.

A requisite in the internal assessment that many seem to overlook is the necessity on the part of the evaluating teacher to write in the margin for each answer the specific defects. The answer scripts, even of the final tests should be returned to the students who may keep them for a day to go through them to benefit from the teacher's remarks, and return them the next day, or the students can be specifically given 1 or 2 hours in the class with the concerned teacher present. The students raise their doubts, if any, on the evaluation and they are cleared. If the teacher finds he has erred, he corrects immediately. Thus the element of partiality is totally removed.

The problem of teacher being subject to external influences does not arise as the process is open and the other students can rightly question him directly and immediately. He has to protect himself from this unpleasantness. The students and their parents also will naturally have to abstain from the present day malpractices. The enforcement of this rule—return of answer scripts to the students—is a mere administrative decision. It is possible that some may try to sabotage this, having got used to the present day laxity.

The students and the educated parents besides the conscientious teachers and the administrator should, however, press for this desirable change vigorously. It is the implementation of this requisite in the internal assessment system which will lead to its success. The present reports of failure of internal assessment from some institutions is because the scripts are not returned to the students with notations as to the defects of each answer.

Together with the internal assessment, if a student counselling system is adopted in which 4 or 5 students are attached to a teacher, they can be properly guided based on their abilities as revealed in the tests and assignments and so help them to improve themselves. It is this way alone that eventual academic improvements, and mutual trust between students, teachers, administrators and the public will develop. It will incidentally also reduce the number of failures and thus the wastage of learning facilities.

Question Bank

Recently suggestions were made about question bank which involves the formulation of all possible standard questions by all the concerned teachers, and the use of a computer or random method for selection of a set of questions for either each student for every examination, or for each examination but for all students. These questions are known to both students and teachers and additions or deletions may be made once in 2 or more years with experience.

This same system can also be adopted with the

question patterns suggested earlier. However, the question bank system will continue to be plagued, probably even worse, with the question and answer notes of the present day. The student may no more be interested in studying texts and reference material. While this may ease the administrator's ordeal, the academic improvements may not be achieved. Further, should the internal assessment of the characteristics outlined earlier is to be implemented, the question bank system may not have to be considered.

External Examination

One criticism against internal assessment is the probability of a teacher not covering the prescribed syllabus and examining the students in the limited syllabus he has completed. One way to check this abuse is to have the system of students' evaluation of teachers for specific criteria which includes the quality and quantity of syllabus covered during the term or year. Examination of these teachers' evaluation reports by the whole departmental staff and the Dean of the concerned faculty, and advising the erring teacher should be helpful. Another method which can be employed together with the first suggestion is to have the final test evaluated by one external teacher also, who is furnished a copy of the syllabus and the model question paper and model answers for his information.

It may thus be noted that all the human foibles can be greatly minimised in the implementation of internal assessment and improved method of testing students' knowledge by proper administrative decisions, and their honest observance. The teacher's work load will however be far greater in this improved system because of greater time taken for setting proper questions at greater frequency, and correction of the many scripts in the suggested ideal way at equally greater frequency. He should naturally have lesser teaching load than the present one, probably half of it.

More teachers will then have to be recruited. If this is done in a specified planned way over the next 3 to 5 years, all the present teachers may willingly co-operate and make it a success. If more teachers are not recruited in a planned manner the system is likely to fail purely because of physical inefficiency of even the willing teachers.

Yet another prerequisite for the success of the internal assessment system is the availability of texts at reasonable prices. Most texts written by Indian authors cost between Rs. 10 and Rs. 20 and a student may have to buy between 10 and 20 books for the complete under-graduate course. This high cost is a disincentive for many of the financially average and poor students. The publishers should probably produce on a much larger scale than now after ensuring its quality when the price could probably be reduced by 30-50 per cent. They could bring out new editions of such quality books once in 3 to 5 years, which should help the sales of their books as well as periodical updating of the quality of knowledge for our students. ●●

Education And Employment in Fifth Plan

K. L. JOSHI

THERE IS a kind of academic revolution going on since 1960 all the world over and no less in India. Attempts at forecasting manpower needs, relating investment in education to economic goals, changing educational structure in relation to national needs, problems of teachers and students and of educated unemployed—all such concepts have been thrown up to the surface as challenges to social thinkers and planners.

An action programme to meet at least partially some of the challenges on a fundamental basis of changes in educational structure is indicated.

Work in Education

Unemployment of educated people should be looked at as a general unemployment problem—whether educated or uneducated due to economic backwardness—and there is as much responsibility of the State to see that all people are properly employed whether educated or uneducated. However, there is a greater responsibility of the State for providing employment to educated people when the Government directly spends so much money on their education. Every development plan is intended to generate more employment opportunities and the education system should be such as would result in providing training and developing skills useful in various sectors of the economy. Work itself is education, and not education for work should perhaps be the thesis for the Fifth Plan and larger

amounts have to be provided for work programmes and for programmes of education and training for all types of workers.

However, today the educated persons become a heavy weight on the economic system because they are not properly educated or trained. The present education system is to blame for it.

Recently Ministers and other responsible authorities have talked about changing the education system to suit the economy. As a member of the Central Advisory Board of Education on behalf of the Inter-University Board, when I was Vice-Chancellor of the Indore University, I had mentioned at the last meeting of that body in September 1972 that during the last 25 years we have committed many blunders in the field of education and one of the greatest blunders was the introduction of Higher Secondary system and the abolition of the well tried intermediate system which was current for nearly 100 years.

Education is a field of conservatives and changes or reforms cannot be done radically except perhaps in a dictatorial system.

At present the system of higher education has gone beyond the control of the Central and the State Governments. The Universities are no doubt autonomous but they can neither control it nor direct it. The Central Universities are in a mess and the State Universities are facing tremendous financial problems. Even the IITs are facing internal problems and there are signs that the traditions in the field of higher education are crumbling in the face of new circumstances. We cannot enforce academic or social reforms in a revolutionary age

The author is former Vice-Chancellor of Indore University and a UGC fellow at Gokhale Institute of Politics & Economics, Poona.

NEW TEXT-BOOK IN ENGLISH FROM THE U.S.S.R. AVAILABLE IN INDIA

1. Handbook of Physics, B. Yavorsky and A. Detlaf, pp. 965. Rs. 17.40 (Mir Publishers, Moscow).

This handbook defines the basic concepts of physics, concisely formulates physical laws and the essence of the phenomena described. All branches of classical and modern physics are covered.

The six main parts of the book include : Physical Basis of Classical Mechanics, Fundamentals of Thermodynamics and Molecular Physics, Fundamentals of Fluid Mechanics, Electricity and Magnetism, Wave Phenomena, and Atomic and Nuclear Physics.

The appendices present the units of physical quantities and their dimensions in various systems, and the values of universal physical constants.

The handbook is intended for use by engineers, technicians, students of universities and engineering institutes, post-graduate students, teachers of high schools, and lecturers of institutes. Being a store-house of up-to-date authoritative data on the subject, with especial stress laid on basic concepts and mathematical methods, this handbook can be used by anyone interested in the field.

The textbook is divided into the following six parts:

1. The Physical Basis of Classical Mechanics ; 2. The Fundamentals of Thermodynamics and Molecular Physics ; 3. The Fundamentals of Fluid Mechanics ; 4. Electricity and Magnetism ; 5. Wave Phenomena ; 6. Atomic and Nuclear Physics. The text-book also had two appendices at the end.

2. Petroleum, V. Sokolov, pp. 335, Rs. 7.40 (Mir Publishers, Moscow).

This book presents the up-to-date knowledge in the field of petroleum and gas. It covers a wide range of topics of historical, scientific, and engineering interest. The author discusses modern concepts concerning the geology and geo-chemistry of petroleum and associated gas, their origin, and the formation of petroleum and gas deposits. Methods of petroleum and gas prospecting and production are described, and data, on their reserves are presented. The book also deals with such aspects as transportation and storage of petroleum and gas, their processing into various products, etc.

The text book is divided into the following Ten chapters:

1. A Little History ; 2. Geology and Geochemistry of Petroleum and Natural Gas. Their Prospecting and Exploration ; 3. Production of Petroleum and

Gas ; 4. Is there much Petroleum on Our Planet ? 5. Transportation and Storage of Petroleum and Natural Gas ; 6. Composition of Petroleum and Gas ; Methods of Studying Them ; 7. Petroleum Processing ; 8. Gas Processing ; 9. Petrochemical Industry ; 10. Cybernetics and Automation.

3. Machine Tool Design (Vol. I) General Editor N. Acherkan, D. Sc. pp. 600, Rs. 8.40 (Mir Publishers, Moscow).

This is the second edition of the popular textbook recommended for republication by Indian specialists under the programme of the Joint Indo-Soviet Board to make the best Soviet textbooks available to Indian students.

This fundamental four-volume work was written by scientists and specialists on the teaching staff of the Machine Tool Engineering Institute in Moscow. The editor, Prof. N. Acherkan, D. Sc. (Engineering), is an eminent Soviet specialist in machine and design and the author of over fifty scientific works and textbooks. Prof. Acherkan holds the title of Honoured Scientist of the Russian Federation and has occupied the chair of Machine Tool Design for 35 years.

The present work was translated from the considerably revised and recently published second edition which includes all the latest achievements in world machine tool practice. The earlier editions have become an indispensable hand-book for Soviet designers. Therefore this work will be of great value to engineers engaged in the design, manufacture and maintenance of machine tool equipment. It can also be used to advantage by the students of engineering institutes majoring in Process Engineering, Metal-Cutting Machine Tools or Cutting Tool Design.

Vol. I deals with the basic machine tools and special machine tools used in cutting tool production. The classification, type and size range, and designation of machine tools, employed in Soviet practice, are given in detail, together with the types of motion found in machine tools. Metal-cutting lathes, turret lathes, vertical boring machines, automatic and semi-automatic lathes, milling machines and many other types of machine tools are described.

Special attention has been given to machine tools designed for the production of cutting tools. Part one was written by Nicholas Lisitsyn, Alexander Gavryushin and Oleg Trifonov, Candidates of Science, and Part Two by Prof. Alexander Kudryashov, Candidate of Science.

4. STRENGTH OF MATERIALS: V. Fedosyev, pp. 608, Rs. 7.25 (Mir Publishers, Moscow)

This book has been recommended for publication by Indian specialists under the programme of the Joint Indo-Soviet Textbook Board to make the best Soviet textbooks available to Indian students.

This introduction to the theory of the strength of materials, while intended primarily for mechanical engineers, can be used as a general textbook by students of engineering faculties of universities and colleges of technology.

The problems covered include tension, compression, shear and torque, the geometrical characteristics of bar sections, etc. The theory of bending and the present theories of strength are outlined and discussed, while at the end of the book the author describes in simple language the advanced method of strength analysis by limit states.

Strength of Materials contains numerous examples and problems, with suggested solutions. Reference

People's Publishing House (P) Ltd. Rani Jhansi Road, New Delhi-55

PPH Book Stall
190-B, Khetwadi Main Road, Bombay-4

People's Book House
Piramshah Manzil, Relief Road
Ahmedabad

Manisha Granthalaya (P) Ltd.
4/3B, Bankim Chatterjee Street
Calcutta

National Book Agency (P) Ltd.
12, Bankim Chatterjee Street
Calcutta

NCBH (P) Ltd.
6/30 Mount Road, Madras

Prabhat Book House
Trivandrum

tables are provided in an appendix.

The book has had five editions in Russia and has been translated into French as well as English.

Prof. Vsevolod Feodosyev, D. Sc., a Lenin Prize Laureate, is a leading Soviet scientist in the field of the theory of elasticity and problems of the strength of mechanical elements.

Prof. Feodosyev's published works include Methods of Strength Analysis in Mechanical Engineering, Elastic Elements in Instrument Making, and Strength of Heat-Stressed Units in Rocket Engines.

In addition to his extensive research work, Prof. Feodosyev is actively engaged in teaching, holding a chair at the Bauman Higher Technical School in Moscow, one of the oldest higher educational institutions in the USSR.

These books are available with booksellers throughout India and definitely with the following distributors of Soviet books in India :

Visalandhra Publishing House
Eluru Road, Vijayawada

Visalandhra Book House
Sultan Bazar, Hyderabad

People's Book House
Opp. Patna College, Patna

People's Book House
Hazaribagh Road, Ranchi

Navakarnataka Publications
Bangalore-9

Nabujuga Granthalaya
Bajrakabti Road, Cuttack
Himachal Book Centre
4, The Mall, Simla

Punjab Book Centre
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REGISTRAR

unless the institutions are modified internally. The remedy is governmental intervention in University affairs which takes away any academic freedom for the faculty, whatever vestiges of such freedom are left over the developmental years.

Silent Teachers

There is a great deal of misdirection in the field of education. Educational statistics by which we swear are generally not reliable and where they have found no data to verify vague ideas, our own experience and that of our informed observers who, like ourselves, are often relying on impressions are used for projected thinking. Therefore in a picture of crisis in the field of education, those who are concerned with policy-making and particularly the bureaucracy reflect their own inflexible ideas, prejudices and blind spots. The academics overpowered by economic tensions and suppressed by political pressures are generally silent. They are losing courage to speak out. There cannot be any clear-cut evaluation of the present system or perspective programmes from the Government secretariat only. On the other hand, however, those who are in the Universities or in the teaching field are lost in the day-to-day work of learning, teaching and research and cannot go beyond their own impression to see the picture as a whole and look at it from the angle of the Government, the people and the system. Besides they hardly have much information. Thus we arrive at objectives and aims which are often contradictory when done sector-wise or piece-meal and most of us cannot be honest about the picture and tend to be ambivalent and uncertain.

In the academic revolution that is going on today in this country (as well as in the advanced countries of the U.S.A., U.K., West Germany and Japan), the professionalism, that is the unified faculty or teachers have an informal veto in most Universities and colleges and their objective appears to be not to take any special steps to implement new suggestions made in various Government or UGC reports; nor do they desire to express their criticism for fear of antagonizing either the students or the vested interests or the politicians. They just remain silent. That is how the UGC reports on improvement of syllabus have remained in cold storage and even the Education Commission Report has only become a reference book.

Recalcitrant States

The State Governments which are mainly concerned with educational policy look upon the Centre's advice with a certain amount of demur and are very often recalcitrant about anything that goes to them from New Delhi. That is why the educational policy document which primarily concerns the State Governments and which technically need not have gone to the Parliament cannot percolate to the people through the State Governments.

The Sector of Higher Education in India is to prepare manpower for various areas of our economy

and cohesive society, through the economic law of direct and indirect benefits out of any investment. Some of the benefits could be identified and are measurable and good many could be described as externalities of education.

In the light of the public criticism and the problem of employment we have now to see if we could build up ties between the occupational structure and higher education. I think there are at the outset three steps which we can take to remedy the situation in the Fifth Plan.

Open University

In regard to large numbers going to the universities whom we cannot control or restrain we have to introduce the 'Open University' system, a very much Indianised version of the concept current in the U.K. and Japan. It cannot be one open university but all universities could provide facilities for students appearing privately, whether employed or otherwise, and provision of 'Open University' paraphernalia could be made for them. Correspondence courses, evening courses, part-time courses, short-term courses could be introduced in the existing buildings of colleges and the students allowed to appear for the university examinations "openly" without attending the regular colleges, particularly in arts and commerce and with separate provision of laboratory facilities in science. This is because the students say that they do not get anything out of the teachers of regular colleges and the teachers tend to blame the students for their lack of quality and application.

On the other hand we have found that the so-called teaching shops or coaching classes in metropolitan cities like Delhi, Bombay, Calcutta, Madras, Poona, Bangalore, etc. are doing extremely well without any signs of indiscipline among the students who pay for what they get out of the teaching or coaching and the teachers do not demand higher wages. It is understood these institutions are mostly profit-making bodies but even regular college students prefer them to college tuition and attend them more assiduously than the colleges.

These factors have to be properly recognised and in an 'Open University' a number of such ideas could be incorporated. What the University can only do is to provide a good library with some teachers in the library who really could guide the students for their reading courses and tutorials.

'Open University' will logically mean that there will be no more colleges in the 5th Plan and even the universities if established will be only for post-graduate and research purposes. Details of the scheme for India can be worked out.

Community/Junior Colleges

The second suggestion for training in skills in relation to employment opportunities is the introduction of community colleges or junior colleges as in the U.S.A., Canada, Sri Lanka and Japan. In India such institutions have to be established under one

umbrella where all students of different aptitudes could be brought up.

The entry to these will be after the 10th class or matriculation, but there could be scope for multi-point entry to these colleges in accordance with age and aptitude. These are in a sense intermediate colleges but not of the U.P. or Kerala pattern. They are of a comprehensive nature to be known as comprehensive junior or community colleges in which all types of courses ranging from a duration of 3 months or 6 months or one year to 2 or 3 years could be included both of terminal and transfer nature. The present polytechnics, industrial training schools, primary teachers training schools, and other institutions of the same type in agriculture, home science, technical schools, etc. have to be brought under the scheme.

It will be obligatory for the institutions to serve the community by providing all types of courses for regular students of the age group 16-19 and for the adults, for the employed people and for the citizens irrespective of the age or educational qualifications; courses of training are to be tailored to their needs and not *vice versa*.

History of our educational system as it has come down to us today more or less leads us to this impor-

tant step in the 5th Plan. Actually this could be considered as a national programme for the minimum needs, as important as the one for drinking water, health and nutrition and home sites for the rural landless.

Work Programmes

The suggestion made in the Approach to the 5th Plan document in regard to the minimum needs of elementary education has to be considered rather cautiously because we often forget that the actual directive of Article 45 of our Constitution makes it clear that the State will make an *endeavour* to provide free and compulsory education for children upto the age of 14. This *endeavour* we have made during the last 25 years and to that extent we have carried out the central idea of the constitutional directive.

But we have gone very far in providing primary and elementary schools without proper administrative control or physical facilities with the result that in a number of villages there are teachers appointed who do not have proper buildings to teach and therefore do not have students though attendance rolls indicate a large list vitiating educational statistics. It would be much better to provide work programmes first and then provide education through the techniques of adult and societal education. ●●

24th year of continuous publication

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Editors : Mrs. Nirmala Bhatkal
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Yearly Subscription : Rs. 15 (Indian); Rs. 20 (Foreign)

Address :

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Employment Opportunities

Govt. Measures

1) The Planning Commission has made a revised allocation of Rs 48.26 crores for employment of educated unemployed during the year 1973-74. Besides, a new programme for educated unemployed has been started by the Government with a Central budget allocation of Rs. 100 crores for 1973-74.

2) An amount of Rs. 23 crores has been earmarked by the Planning Commission for allocation to State Governments and Union Territories for formulating special employment programmes for which the States will have to contribute another Rs. 23 crores.

3) Financial help is rendered to enterprising unemployed persons by Nationalised Banks.

4) The Planning Commission and the State Governments are also working out schemes for employment so that qualified persons may not have to go abroad for lack of employment.

5) The Government of India appointed a "Committee on Unemployment" to assess the extent of unemployment and to suggest remedial measures. The Committee have submitted an interim report on short-term measures for employment.

6) A monthly "Technical Manpower Bulletin" is published giving particulars of persons who are available for employment. Copies of the Bulletin are distributed free to the various employing organisations.

7) Suitable candidates are recommended in response to requirements notified to the CSIR by employers and recruiting bodies.

8) The CSIR also scrutinises advertisements appearing in important newspapers and makes

recommendation of registrants with appropriate qualifications for consideration against these advertisements.

9) Research Fellowships are offered by the CSIR, U.G.C., I.C.M.R., I.C.A.R., etc.

10) Research schemes in Universities and other institutions are financed by different agencies to generate employment.

11) The Scientists' Pool scheme operated by the CSIR provides temporary placement to scientists, technologists, etc. with high academic records.

12) The scheme of supernumerary appointments is in operation for quick absorption of highly qualified scientists and technologists.

13) The UGC has also agreed to provide assistance for the creation of senior Staff positions in various specialities/University Departments and for further development of laboratory and other facilities including the purchase of specialised equipments.

14) The Planning Commission has also drawn up the following 14-point programme, of employment opportunities:

—State Governments and the Central Ministries may take up preparatory work in connection with projects to be included in the Fourth and subsequent plans to the extent resources are available or can be provided.

—The preparation of technical reports for selected completed major projects may be taken up under the supervision of senior engineers.

—The training-in-industry programme of the Ministry of Education may be expanded.

—Arrangements may be made

for the training of 1,500 graduates and diploma holders for the operation and maintenance of thermal stations.

—Vacant posts may be filled rapidly, recruitment procedure and prescribed qualifications being modified wherever possible. The general ban on the filling of vacant technical posts may be lifted.

—An early decision may be taken on the introduction of a short service technical commission for the Army Technical Corps.

—The development of Indian Consultancy Organisations may be encouraged.

—A special scheme may be drawn up for financial assistance to engineers for the setting up of small scale industries. The existing State Bank Scheme may be re-examined in the light of the response so far evoked.

—The contractual provision requiring approved contractors to employ qualified engineers may be enforced.

—Engineers may be encouraged to set up cooperatives for undertaking construction work or for setting up repair and servicing facilities for agricultural machinery in rural areas.

—Avenues may be explored for the employment of engineers in marketing, sales and management posts in public undertakings.

—A multi-speciality approach may be adopted to scientific research and development.

—Special efforts may be made through our Missions abroad to send out technical experts to friendly developing countries to assist in their development programmes.

—The suggestion of the Ministry of Labour & Employment that factories employing more than a particular number of workers and using power be obliged to employ a qualified engineer may be examined further in consultation with the Ministry of Industrial Development and Internal Trade.

Round Up

Academics Must Have a Say in Decision-making

—Amrik Singh

DR. AMRIK SINGH, Director South Delhi Campus of University of Delhi, while delivering the Convocation Address of the Sardar Patel University surveyed most critically the contemporary academic scene, and discussed at length the functions of the teacher in our educational set up.

One of the problems of higher education is that it is receiving more attention than it deserves in terms of the needs of the economy and the welfare of the country, he said. Two decades ago when planning was undertaken on a systematic basis, the proportion of expenditure on higher education was one sixth of the total expenditure on education. Today this proportion had doubled.

The theory so far has been that the more higher education we have the better it is for the country. This is a theory which is unique not only to India but to quite a few other Asian countries too.

Dr. Amrik Singh pointed out that while decision-making, in almost in every country, is with the government, in certain countries academics are able to influence the Government in various decisive ways. Unfortunately in our country this is not so. Quite a few academics are drawn into the Government but before one knows what is happening they find themselves very much a part of the Government. Of course, there are a few happy exceptions, he added.

In fact, one of the more distressing things about the Indian academic scene is the comparative irrelevance of those who for want of a better word may be described as the natural leaders of the profession. Even when they say things which are pertinent, there is an unreality about what they say. The bulk of the academic community gives them a kind of consideration to which they are entitled by virtue of their ability and standing. If the frame of reference within which an outstanding teacher operates is largely confined to universities in other English speaking countries, which unfortunately is happening to quite an extent today, there should be nothing surprising about such people finding themselves respected but isolated. Isolated not in the academic sense but in the social sense. The absence of a professional awareness amongst the academics in India constitutes one of our major problems. Decision-making is either with the Government or with the Vice-Chancellors, members of the Syndicates or Principals, most of whom become a part of the power structure which has grown up in each university.

But there is no getting away from the fact that the universities have become as much places for political manoeuvring as several other sectors of activity. The natural leaders of the profession are kept out of this power struc-

ture. Instead power is manipulated and controlled by people who have close and active links with the politicians outside. Thus, he said, a new class of teacher-politicians has been enabled to grow with results too obvious to need any comment.

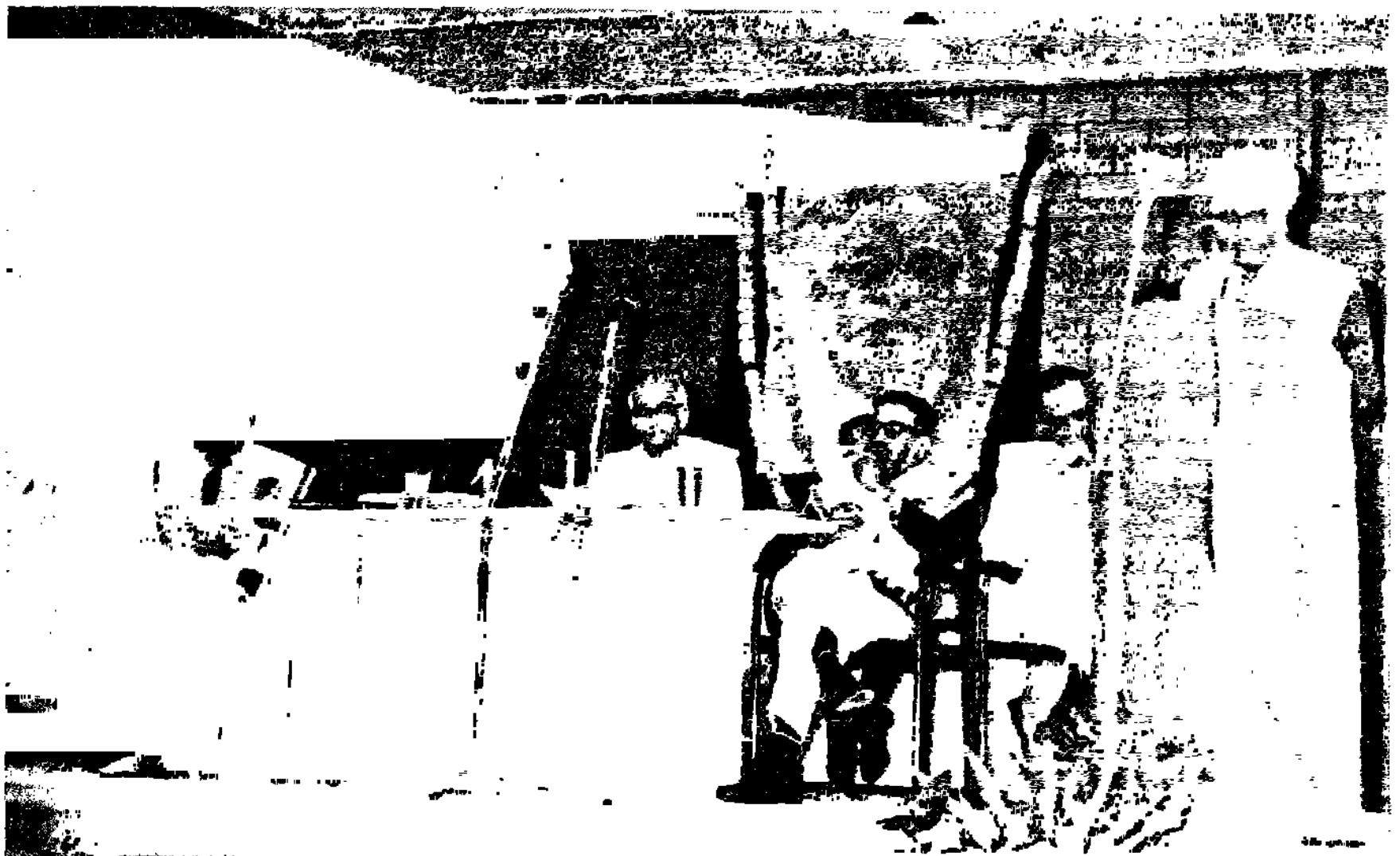
Giving a solution to this, Dr. Amrik Singh, pointed out that these are not reasons enough to dismiss it as even unworthy of consideration. The most obvious thing that needs to be done is to save the universities from further politicisation. While the political parties have a very definite role to play in this task, some others too have a role to play. In fact it is these others, principally the teachers, and secondarily the students, that can if at all, prevent the politicians from penetrating the universities.

Perhaps the most pathetic aspect of our political situation today is that there is very little choice to be made from amongst those who are in office or out of office. The ethical values are approximately the same and their lust for power is equally fierce and unrelenting and it is not going to help if we deplore what they do.

To blame the students, he said, would be to blame ourselves partly. Students only provide the cadre and not the leadership. The fact of the matter is that in the complicated situation in which we find ourselves it is not necessary or desirable to blame anyone. What is necessary, he pointed out, is to identify those forces which can be enabled to discover their identity, grow in strength and change the complexion of things to the extent that it is possible to change.

The only force which either has the capacity or the inherent sense of commitment to bring about a change in the academic situation is the academic community and unless the academic community moves into the centre of things and takes charge of decision-making, there will be very little left of what is called academic life or the academic system.

Addressing the young gradu-



Dr. Amrik Singh delivering the Convocation Address at Sardar Patel University

ates of the year, he said "Some of them might feel that these are matters which concern them but remotely and that their immediate concerns are different. They would be right to some extent but the fact remains that we are at a stage in our history where unless there is better interaction between all those engaged in the academic process and a commonness of endeavour we are not going to solve our problems. And a very important question to ask is: Can our country go on like this for another couple of decades without solving these problems?"

International Varsity for Taxila

PAKISTAN WILL set up an international university for Buddhist and Pali studies at Taxila, once a renowned seat of Buddhist learning with the assistance of UNESCO and Asian countries.

Pakistan Minister of State for National Affairs told Pakistan

Press International in Rawalpindi that a decision in this connection was unanimously taken by the conference on a resolution moved by Pakistan.

He said that countries like Sri Lanka, Nepal, Burma, Thailand and Japan would assist in the project.

U.P. Education Grants Commission

ACCORDING TO a recent decision of the U.P. Govt. a Higher Education Grants Commission is soon to be set up to examine the financial needs of the State Universities and degree colleges and to allot and distribute grants to them out of the State's own funds. Besides a full-time non-official chairman who will head the proposed commission, two leading educationists will be associated with it.

The Commission will advise the Government on the opening of new Universities and expansion of existing ones. It will also

advise universities on opening new colleges and improving the standard of education. It will collect information about the financial condition and educational standards of Universities and degree colleges.

The State Education Secretary and the Finance Secretary will be ex-officio members of the Commission which will have powers to nominate in their place a person up to the rank of the Joint Secretary.

Petroleum Geology Course at OU

THE OSMANIA University's Department of Geology has introduced "Petroleum Geology" as a special subject at the post-graduate level. The first batch consists of eight students, who will be sent for training in petroleum exploration studies at Dehra Dun (U.P.) and Ankaleshvar oil fields in Gujarat. Dr. B.E. Vijayam, Secretary, Indian Academy of Geoscience will be incharge of this course.

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(A) Deputy Librarian: (a) First/Second class B.A./B.Sc./B. Com. degree plus 1st or 2nd class M. Lib. Sc. Degree (Two year course) OR First-second class MA/M.Sc./M.Com. degree and first or second class B.Lib.Sc. or one year diploma course in Lib. Science.

(b) At least 5 years experience as Librarian or of working in responsible professional capacity in a Library.

(B) Deputy Registrar: (a) First or high Second Class Post-graduate Degree. (b) at least seven years administrative experience in a position involving supervision, control and planning.

Desirable: (i) Familiarity with the life and working of a University or with educational administration in a College, University or an Institute of higher learning or research.

(ii) Experience of teaching in a College or a University.

(iii) A Degree or a Diploma in Management or Law.

(iv) Thorough experience of Establishment Section conducting examinations in a University/Board of Secondary Education or a comparable institution/experience of University development planning and project works, and familiarity with U.G.C. scheme.

Note: Persons already working in a University as Assistant Registrars for at least 4 years and possessing a minimum total administrative experience of 10 years could be considered eligible for the post. Experience in the cadre of Section Officer or equivalent posts and above will be counted as administrative experience.

(C) Research Assistant — Chemistry: Essential: A first or high second class Master's degree in the subject concerned with proved capacity and aptitude for

research work. Preference will be given to candidates who are engaged in research work.

(D) Instructor — Mechanical Engineering: Essential: Degree or Post-Matric Diploma in Mechanical/Production Engineering with 2 years experience in Refrigeration and Air conditioners. Desirable: Teaching experience and experience in Allied Trade.

(E) Console Operator (Computer Section) B.Sc. (Physics, Mathematics) or Diploma in Engineering (Electrical or Electronics) Desirable: Knowledge of FORTRAN Programming. Previous experience as Console Operator for TDC-12 system.

(F) Senior Technician (Mechanical Engineering Department): Essential: Fairly good general education and about ten years approved practical experience in the trade concerned or post matric diploma in Mechanical Engineering with two years approved workshop experience in metal cutting laboratory (Lathes) or a matric with ITI Certificate in Turner trade with not less than 5 years approved practical experience in workshop of repute. Desirable: Operation of Capstan and Turret Lathes Surface grinding.

(G) Technicians

Computer Section : Essential: ITI trained in Electrical or Radio and Electronic trade. Desirable : Previous experience working on TDC-12 system.

Mechanical Engineering: (Internal Combustion Engines).

Essential: I.T.I. or diploma certificate in the above trade with two years experience or good general education with approved practical experience of 5 years in a similar position or in an Automobile Workshop of repute.

Qualifications as mentioned above may be relaxed in cases of candidates who are otherwise found suitable. Higher starting salary is possible to exceptionally qualified candidates. Those who have already applied for the post of Deputy Registrar in response to Advertisement No. 2/72 need not apply again. They may however intimate on plain paper if they have obtained any additional qualification or any change in the address.

Application forms can be obtained from the undersigned for which a crossed Indian Postal Order for Rs. 2/- endorsed in favour of the Registrar, Jodhpur University payable at Jodhpur be sent along with a self-addressed envelope of 24x11 cms. bearing postage stamps of 35 paise. The last date for receipt of application is February 14, 1974. The Vice-Chancellor may at his discretion condone delay in receipt of applications.

(S. Chakrabarti)
REGISTRAR.

UNIVERSITY OF JODHPUR JODHPUR

Dated 7.1.1974

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APPLICATIONS are invited for the following posts in the scale of Rs. 1100-50-1300-60-1600.

Professors: One in each subject. Civil Engineering, Structural Engineering (Temporary), Geography, Philosophy and Political Science.

Posts carry allowances and other benefits as may be admissible under the rules of the University from time to time.

Qualifications:

Professors: (i) Civil Engineering, Structural Engineering:

Essential: (a) Postgraduate in first or Second class in Civil of an Indian University or an equivalent qualification of a foreign University (b) Teaching experience of five years in an Engineering College of degree standard in the branch concerned and practical or research experience for minimum period of two years (For post of Professor in Structural Engineering persons who have obtained degree of Civil Engineering with subjects of Structural Engineering will be considered).

(ii) Geography, Philosophy and Political Science:

Essential: (a) A first or high second class Master's Degree of an Indian University or equivalent qualification of foreign University in the subject concerned; (b) Either a research degree of a Doctorate standard or published work of a high standard; (c) Teaching experience at a University or College of about 10 years with at least five years of post-graduate work and experience of guiding research.

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(S. Chakrabarti)
REGISTRAR.

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Mathematics

1. Gaur, Ravinder Singh. Bulk queues. Kurukshetra University.
2. Geetha, P.K. Studies in weighted spaces. University of Madras.
3. Masood, Mohammad Abu. Gronwall's functional inequalities, differential equations and their numerical analysis. Jadavpur University.
4. Pal, Mukulbihari. Some problems connected with the measure of a set. University of Kalyani.
5. Ram Singh. Study of some subclasses of the class of uni-valent functions in the unit disc. Punjabi University.
6. Roy, Lakshmi Kanta. Some problems in the theory of plasticity. University of Kalyani.

Statistics

1. Gupta, Radha Krishna. Investigations in mathematical programming. University of Delhi.
2. Rajinder Singh. Application of combinatorial problems on sampling theory. Punjab Agricultural University.

Physics

1. Gaur, Ravindra Kumar. Study of nuclear tracks in photographic emulsions. Kurukshetra University.
2. Jain, Santosh Kumar. Study of some aspects of sky wave propagation related to F_2 region of the ionosphere. Awadh Pratap Singh University.
3. Malik, Gulshan Prakash. Particle-interaction phenomena with polynomial and nonpolynomial interaction lagrangians. University of Delhi.
4. Parthasarathy, R. Studies in muon capture by complex nuclei. University of Madras.
5. Pramanik, Bani. Studies in some problems on plates and shells in magneto-elasticity and magneto-viscoelasticity. Jadavpur University.
6. Rawal, Upender. Study of electromagnetic diffraction by some conducting structure with special reference to perturbation in shape, non-uniform conductivity and dissipative surrounding medium. Jiwaji University.
7. Sharma, Brij Rai Kishore. Theoretical investigations on solutions. Kurukshetra University.

Chemistry

1. Bhaskarajah, G. Organic chemistry of nitrogen and sulphur: Contributions to the chemistry of dithiobiurets and related systems, reaction of alkylhalides and ethylchloroformate. Nagpur University.
2. Bhattacharyya, Birendra Nath. The formation, sintering and properties of Al_2TiO_6 and its use as a refractory and thermal shock resisting material. Jadavpur University.
3. Chatterjee, Asis Kumar. Physico-chemical studies on some L-hydroxy acids. Jadavpur University.
4. Ghosh, Bhaskar. Isolation and physico-chemical studies in *L. esculenta* pulse seed proteins. University of Kalyani.
5. Jog, Mohan Shankar. Studies on some complexes of organic ligands in solution. Nagpur University.
6. Katiyar, Pushplata. Kinetic studies of the reaction of methyl violet in acid and alkaline medium. Kanpur University.
7. Mahto, Yogeshwar. The catalytic vapour phase oxidation of benzenoid hydrocarbons and its mechanism. Ranchi University.
8. Nandi, Ashok Kumar. Complex carbonates. University of Kalyani.
9. Paul, Smriti. Viscometric and dilatometric studies on melts. University of Kalyani.
10. Premila, M.S. Studies in alkaloids. University of Madras.
11. Raghunathan, K. Chemical examination of a few plant products considered to be of economic and medicinal value. University of Delhi.
12. Santokh Singh. Studies in medium size heterocyclics. Punjab Agricultural University.
13. Sarkar, Asok Kumar. Studies on some organic reactions of synthetic importance. Jadavpur University.
14. Shah, Kiritkumar Bapalal. Metal complexes of oximino ligands. M.S. University of Baroda.

15. Sharma, Hem Lata. Investigations on metal complexes of some hydrazones. University of Delhi.

16. Virmani, Ram Naresh. Metal chelates of 1-(2-quinolyazo)-2-phenanthrol (QAP). University of Delhi.

Earth Sciences

1. Rama Rao, P. Petrology and geochemistry of the granites of Kanigiri-Gogulapalle Area, Andhra Pradesh, India, Andhra University.
2. Shah, Champaklal Pujalal. Geology of the area around Garampani, District Nainital, U.P. M.S. University of Baroda.

Engineering & Technology

1. De, Amiya Kumar. Optimized design of piston heads. Jadavpur University.
2. Ray, Subir. On digital analysis of transient performance of a multimachine system. Jadavpur University.

BIOLOGICAL SCIENCES

Botany

1. Padate, Satyendra Narayanrao. Studies on the flora and vegetation of Savli Taluka. M.S. University of Baroda.
2. Vital, B. Panduranga. Studies on mycoflora of leaves and litter. University of Madras.

Zoology

1. Brahmanandam, Vijayalakshmi. Some biochemical studies on the gastropod muscle proteins with particular reference to aestivation. Bangalore University.
2. Gopal, V. Electrophysiological studies on the role of oral mechanisms involved in influencing food intake. Bangalore University.
3. Savithramma. Influence of dietary deficiency on neural mechanisms concerned with feeding. Bangalore University.

Medical Sciences

1. Ghosh, Dipak Kanti. Synthesis and pharmacological evaluation of simple analogues of reserpine and phytochemical investigation of *Erythrina lithosprama*. Mig. Jadavpur University.
2. Vimaladevi, M. Chemical examination of *Thevetia Peruviana* and some Antarylladaceae plant of India. Andhra University.

Agriculture

1. Balasundaram, Narayanaswamy. Studies on the induction of mutations in sugarcane. University of Madras.
2. Chowdhury, Anil Kumar. Studies on Tungro virus disease of rice in West Bengal. University of Kalyani.
3. Darshan Singh. Cytogenetic studies of chromosomal interchanges in *Pennisetum typhoides* (Burm.) S & H Punjab Agricultural University.
4. Das, Subodh Kumar. Transformation of sulphur in arable and submerged soil conditions and effects of sulphur on growth yield and quality of paddy and wheat. University of Kalyani.
5. Dhan Ram. Investigations on fertilizer and mulch use efficacy for hybrid bajra no. 3 under dry farming conditions. Haryana Agricultural University.
6. Ghosh, Dipali. Studies on the chemical constituents of some insecticidal plants. University of Kalyani.
7. Gurbachan Singh. Stability of genetic parameters over generations and environments in diallel crosses of wheat, *Triticum aestivum* L. em Thell. Punjab Agricultural University.
8. Hans Raj. Investigation on the chemical control of *Rhizoctonia solani* Kuhn. Naryana Agricultural University.
9. Kushal Pal Singh. Genetic divergence and quantitative inheritance studies in gram, *Cicer arietinum* L. Haryana Agricultural University.
10. Lal, Madan Mohan. Genetic study of economic characters in muskmelon, *Cucumis melo* O. Punjab Agricultural University.
11. Luthra, Om Prakash. Genotype X environment interactions and automatic ranking of genotypes in wheat. *Triticum aestivum* L. Haryana Agricultural University.
12. Raju, G.S.N. Studies on fixation of NH_4 by soils and its availability to microorganisms and plants. University of Kalyani.

13. Ram Krishan. Studies on mutation induction processes in yeast, *Saccharomyces cerevisiae*. Haryana Agricultural University.

14. Thakkar, Rajen Kumar. Studies on microbial rennet production. Haryana Agricultural University.

15. Tripathi, Narendra Nath. Studies on *Pythium butleri* Subramanian and its control by chemicals. Haryana Agricultural University.

Veterinary Science

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(B. Misra)
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January 22, 1974

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QUALIFICATIONS

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Essential:

1. A Master's Degree in English with at least a II Class.
2. A Doctorate degree or published work of equivalent standard.
3. At least five years' experience of post-graduate teaching and research guidance in a recognized institution.

Desirable:

Experience of organizing English language programmes.

Category B

Essential:

1. A Master's Degree in English with at least a II class.
2. A research degree or evidence of research.
3. At least five years' experience of teaching at the college level; with at least three years experience of post-graduate teaching or 8 years of Honours English teaching in a recognized institution.

Desirable:

Specialized training in the teaching of English.

Category C

Essential:

1. A first class M.A. in English
OR
2. A Master's Degree in English with at least a II class with
 - (i) a post-graduate diploma in English teaching/English studies; or
 - (ii) at least two years' experience of post-graduate teaching in English; or
 - (iii) eight years of B.A. Hons teaching in English at the college level.

Desirable:

A research degree or evidence of research.

N.B.: Statute 21 of the Act empowers the Executive Council of the University to invite persons of high academic distinction and professional competence to accept any academic post in the University and on special terms if necessary including a contract.

NOTE

1. Persons in service should submit their applications through their employers.
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3. All appointments will be subject to a period of probation.
4. These posts are open to all citizens of India who satisfy the required qualifications but some preference may be given to equally well qualified candidates from areas within the jurisdiction of the University.
5. Besides the basic pay, allowances admissible to the officers of corresponding categories of the Government of India posted at Shillong shall also be paid.

(B.L. Boipai)

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Shillong 793 002
Meghalaya

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APPLICATIONS (eight copies) are invited on prescribed forms available from the University Office on payment of Rs. 3/- (by money order or in cash) for the following posts to be filled in at the following conducted colleges of the Shreemati Nathibai Damodar Thackersey Women's University, Bombay, so as to reach the undersigned on or before February 28, 1974.

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2. Reader in Economics Gujarati/Marathi

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2. Reader in Child Development (Two posts) English
3. Reader in Home Management English

**III. Leelabai Thackersey College of
Nursing, Bombay**

1. Reader in Nursing English

Qualifications

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A. A first or second class Master's Degree of an Indian University or an equivalent qualification of a foreign University in the subject concerned.

B. Either a Research Degree of the doctorate Standard or an outstanding competence assessed from the review of the published Research carried out during the five years preceding the date of the application or the published literary or scientific work during the said period.

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Note: (a) Only selected candidates will be called for interview.

(b) The posts will be filled in according to the medium required.

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March 1974

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Twentyfive Years of N C C



Shri Kirpal Singh Narang, President, APU and V. C. Punjabi University, Patiala, addressing the 49th annual meeting. From Left to Right are Prof. S. K. Bose, Director IIT, Kharagpur; Sir Hugh W. Springer, Secretary-General, APU

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Entrance Examination, 1974

Indian School of Mines, Dhanbad — a deemed University — offers programmes of study leading to the B.Tech. degrees in Mining Engg./Petroleum Engineering/B.Sc. (Hons)/M.Sc. in Applied Geology, B.Sc./M.Sc. in Applied Geophysics, M.Tech./M.Sc. in Mining Engineering/Petroleum Engineering and Ph.D. in all disciplines.

The Institute now invites applications for the Entrance Examination for admission to the first year class of the five-year integrated programme leading to the B. Tech. degree in Mining Engineering/B. Tech. degree in Petroleum Engineering/B.Sc. (Hons)/M.Sc. in Applied Geology and B.Sc./M.Sc. in Applied Geophysics, which will be held on Friday, the 10th and Saturday the 11th May, 1974. The new session will commence on Monday, July 1, 1974.

Likely Examination Centres: Ahmedabad, Bangalore, Bhopal, Bombay, Baroda, Calcutta, Chandigarh, Coimbatore, Cuttack, Delhi, Dhanbad, Digboi, Gauhati, Gudur, Hyderabad, Jaipur, Jodhpur, Keonjhor, Kodarma, Lucknow, Madras, Muzaffarpur, Nagpur, Patna, Raipur, Raniganj, Sahdol, Simla, Srinagar, Trivandrum, Waltair.

A limited number of candidates are admitted directly to the third year programme in Applied Geology/Applied Geophysics on the basis of their performance in the qualifying examinations. The candidates must make a separate application on the prescribed form along with mark-sheets of all the examinations passed by them. When requisitioning an application form the candidate should specify that he is seeking direct admission to the third year programme in Applied Geology/Applied Geophysics.

Qualifications for the above programme

1. For admission to the First Year of the five-year integrated programme:

Pass in Higher Secondary (Science stream with Chemistry, Mathematics & Physics or in the Technical Stream) OR Pre-University or equivalent examination with Physics, Chemistry, Mathematics & English OR Indian School Certificate Examination with Mathematics, Physics & Chemistry OR 1st year examination of the 2-Year Intermediate or F.Sc. Programme with Physics, Chemistry, Mathematics and English.

Age as on October 1, 1974: 20 years for B. Tech. in Petroleum Engineering, 21 years for others. Three years relaxation for Scheduled caste/Scheduled Tribe candidates.

2. For direct admission to the 3rd year programme in applied Geology:

B.Sc. with Geology, Physics, Chemistry or Mathematics and Higher Secondary or equivalent examination with Physics, Chemistry, Mathematics and English.

Age as on October 1, 1974: 24 years. Three years relaxation for Scheduled Caste/Scheduled Tribe candidates.

3. For direct admission to the 3rd year programme in Applied Geophysics:

B.Sc. with Physics, Mathematics and Geology or Chemistry and Higher Secondary or equivalent Examination with Physics, Chemistry, Mathematics and English.

Age as on October 1, 1974: 24 years. Three years relaxation for Scheduled Caste/Scheduled Tribe candidates.

Candidates appearing for the qualifying examination, as mentioned above, will also be eligible to apply but they should submit the necessary evidence of having passed the qualifying examination by June 30, 1974.

Prescribed application form and Memorandum of Information may be obtained on payment of Rs. 3/- (application form Re. 1/- plus postage etc. Rs. 2/-) by money order payable to the Registrar, Indian School of Mines, Dhanbad-826004. Postal orders will not be accepted.

Applications in the prescribed form complete in all respects should reach the Registrar, Indian School of Mines, Dhanbad-826004 by March 31, 1974 for admission to the first year programme and by May 31, 1974 for direct admission to the third year programme in Applied Geology and Applied Geophysics.

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Vol. XII
No. 3



March
1974

A Monthly Chronicle of Higher Education

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Opinions expressed in the articles and reviews are individual and do not necessarily reflect the policies of the Board.

Editor : ANJNI KUMAR

AIU Meets at Kharagpur

The 49th meeting of the Association of Indian Universities was held at the Indian Institute of Technology, Kharagpur on February 2 and 3 under the chairmanship of Shri Kirpal Singh Narang, Vice-Chancellor, Punjabi University, Patiala.

The Association admitted to its associate membership the Gujarat Vidyapeeth, Ahmedabad, and the Central Institute of English and Foreign Languages, Hyderabad. Dr. D.P. Singh, Vice-Chancellor, Govind Vallabh Pant University of Agriculture & Technology, Pantnagar, was elected the next President of the Association from July 1974.

Sir Hugu W. Springer, Secretary-General, Association of Commonwealth Universities was the chief guest. The session was attended by fiftyeight Vice-Chancellors and delegates from various Indian universities. His Excellency Dr. A.R. Mallic, a former Vice-Chancellor of Chitagon University and High Commissioner of Bangla Desh in India attended the session. Representatives of the Ministry of Education, Planning Commission, University Grants Commission were also present and participated in the various group discussions.

Sir Hugh W. Springer in his inaugural address referred to various problems that have arisen due to the sudden expansion of university education after the world war. He said that student organisations at times led by politicians, have demanded greater participation in the governance of the universities, and in many cases have been granted also. The traditional notion of the university as being in *loco parentis* to the student, which survived until 1950, has had to be abandoned almost everywhere.

He also referred to the unprecedented explosion of scientific technology which was triggered by the war and had altered human life so drastically and so rapidly that most of us are unaware of the extent of the change that have taken place. Changes in the techniques of industrial production in manufacture and in agriculture, have been little short of catastrophic; and medical sciences has created for us a time bomb, by removing so many of the causes of early death. So much of this has happened so fast that our ability to manage our world has not caught up with the pace of our innovations. The youth have lost faith in the ability of their leaders to manage affairs. They think that they can do better themselves.

Because we have believed in the equal value of every human being in the sight of God we have often ~~tended~~ to translate this belief into an egalitarian social philosophy. To provide more equal opportunities for all we have rapidly flooded our universities with students, many of whom have no taste for the regime of the university and would be happier elsewhere, and for whom at the end of their university course society can provide no job commensurate with the expectations they have learnt to associate with a university qualification.

And in the tortured state of our inter-connected and inter-dependent world, made one by the miracles of communication

and transportation that we have wrought, he added, every discomfort is instantly communicated from one place to every other.

So our students organise themselves into national and international associations and attempt to subvert the essential purposes of the university. Some even become professional student politicians and use their associations as the instruments of international ideological political parties.

Universities have a difficult time ahead and each has its own set of problems. Fortunately more people are willing to agree today than five years ago that universities have expanded too fast and that the American ideal of mass higher education is questionable as a policy, and is in any case beyond the means of most other countries.

This factor of cost will probably be the crucial one in forcing upon the governments a reappraisal of their policies and in giving the universities the opportunity once more to place quality before quantity and to re-assert their belief in truth and excellence as the ideal of the student, whether scholar or scientist.

Sir Hugh Springer further said that the post-war denigration of elites, though having its origin in the good impulse to oppose the entrenchment of undeserved privilege, has become a dangerous flirtation with barbarism, and that it will come to be expelled from the University world to begin with as being incompatible with the university's essential purpose.

The universities in the modern world are everywhere either totally or in large measures dependent on governments for their resources. The consequence of this dependence is that they owe a greater duty than they otherwise would to serve their country's needs and purposes. The universities would do better if they remain true to their responsibility as universities to seek the truth and fearlessly proclaim it.

These sentiments and beliefs apply of course to all universities everywhere. But we in the Commonwealth have a community of beliefs and standards and shared experience, which makes communications among us easy and which gives us the opportunity to show to the rest of the world an example of effective co-operation between free and independent countries.

List of Ph.D./D. Litt. Theses

Research in economics of education constitutes an important area in the Research Cell recently set up by the Association of Indian Universities. From now onwards there will be regular highlights of research studies, literature and information on economics of higher education. In the first instance, a list of Ph.D. D. Litt. theses accepted by Indian universities compiled from the records of the Association by the Research Cell is given below:

S. No.	Name of the Scholar	Title of thesis	University	Year of award
1.	Azad, J.L.	A critical study of financing higher education in India in the post-independence period.	University of Delhi	1972
2.	Bhattacharya, Apurba Krishna	Educational pattern and employment structure of Madhya Pradesh. (Ph.D.)	University of Saugar	1965
3.	Chaudhri, Dharam Pal	Education and agricultural productivity in India. (Ph.D.)	University of Delhi	1969
4.	Jagdish Narain Singh	Workers' education and industrial productivity in India. (Ph.D.)	Agra University	1968
5.	Misra, Atmanand	Educational finance in India. (D.Litt.)	University of Saugar	1958
6.	Mathur, P.N.	Manpower statistics in supply and demand for critical human skills in India's developing economy.	University of Delhi	1970
7.	Nalla Gound, A.M.	Education and economic development : A study in human capital development in India, 1950-51 to 1960-61. (Ph.D.)	Kurukshetra University	1966
8.	Panchamukhi, Parthasarathi R.	The measurement of the effects of public expenditure with special reference to education and health expenditure. (Ph.D.)	University of Bombay	1968
9.	Pandit, Hriday Nath	Effectiveness and financing of investment in Indian education 1950-51 to 1965-66. (Ph.D.)	University of Delhi	1973
10.	Shah, Kishor Ramanlal	Outlay on education and its financing in India 1950-51 to 1960-61. (Ph.D.)	M.S. Univ. of Baroda	1969
11.	Sinha, Ramashish	Economic planning and educational development of Bihar. (Ph. D.)	Bihar University	1968

Some Problems in Indian Educational Planning

C.B. PADMANABHAN

THE Five-Year Plans in India treat education as one of the major sectors of social and economic activity and hence planning of education takes place at the level of Planning Commission as part of the overall planning for economic development. Education is a State subject but certain programmes for educational development are initiated or sponsored by the Ministry of Education at the Centre and therefore talks take place among the States, Central and Planning Commission representatives and this is how the five-year Plans are finalised. Shorn of the details the above represents the procedure for planning of education in India at present.

Besides being part of an overall plan for economic development an effort is also being made to integrate educational planning with economic planning by setting up targets of enrolment, particularly for certain highly specialised types of manpower, the manpower needed for Indian Economic growth.

APPROACH TO PLANNING

Targets for enrolments in such professional courses are laid down on the basis of manpower requirements for economic growth. However, entry into the higher levels of education is on the basis of an open door policy because it is believed that only by such a policy equality of opportunity can be ensured. But has such an open door policy resulted in equality of opportunity? Who bears the cost of education and to whom accrue the benefits of education? This can be answered only by research. But it may be

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seen that the approach is basically a combination of demand for places and manpower requirements.

The essential basis of the manpower requirement approach was that there is a certain pattern of education needed for a given occupation and educational planning will have to be directed for providing this kind of educational profile. But increasing evidence is mounting to show that there is no rigid relationship between education and occupation and the initial assumption of a fixed co-efficient was wrong. Evidently jobs could be done by persons with varying levels of educational qualifications. There is a large area of substitutability between persons with less or more education. But surely there must be a minimum level of education for performing a given job and in a country like India where demand for education is mounting particularly at higher levels, the question has to be one of finding out what difference will it make for productivity if a person has higher level of education rather than trying to find out the number of persons needed with a certain level of education for doing a job.

HUMAN CAPITAL FORMATION

This takes us to a third approach to educational planning based on the idea that education is investment in human resources and in order to justify a given level of investment in education the returns from investment in education must be at least equal to the return from investment in other sectors of economic activity.

Returns are the higher earnings that accrue to more educated persons as a result of their initial investment in education. They can be calculated by taking into account the lifetime earnings of an individual and measuring it as a return from the cost of education that has been incurred or by finding the present value of the earning stream and taking into account the cost stream and finding out the rate of interest which will equal the cost and benefit stream. This is called the internal rate of return. Whatever be the method adopted, this refers only to the private returns from investment in education.

SOCIAL RETURNS

When it comes to the question of measuring the social returns from investment in education, we have to admit that such returns can accrue from investment in education as well as from other kinds of investment on a human like health and nutrition. These are important considerations especially when the contribution of education to economic growth through improvement in the quality of human resources is assessed.

It may thus be seen that there are difficulties in identifying and measuring the benefits arising from investment in education. Indeed the cost of education has to be calculated in the economic sense of the term taking into account the fact that all costs are opportunity costs. Thus when the student is at

school or college, he also foregoes a certain income which he could have earned and this has to be added to all the other items of cost.

Further the earnings that accrue to an individual may be the result of a combination of factors like ability, parentage, the habits of employees rather than education etc. Indeed these are not insurmountable problems in research and they have been separately identified for example in a study for Kenya.

We have mentioned the foregoing unresolved issues inherent in the human capital formation approach not to disparage its usefulness but to draw attention of the researchers in the field of Indian human resources development.

From the point of view of efficient educational planning, we would note the following important contrasts between manpower requirements and human resource investment approach:

(1) While the manpower requirement approach would only call for a look at the flow of pupils from one grade to the other, the human investment approach builds up into his models anticipated wage differences as determinants of behaviour regarding the entry into higher education. Persons choose to go for higher education only because at the existing levels of wages, returns will be adequate to take care of the cost. The individual takes into account the cost and benefit arising out of a given level of education. Thus while the human investment approach recognises the cost side of education and the benefit in the form of wages, manpower approach does not take into account both these. It should be recognised that it is possible within limits to vary the cost of education and wages in a mixed economy like India's.

Secondly the human investment approach recognises that such investment can take place either within the educational system or outside in the form of on-the-job training which manpower planning approach takes it for granted that the educational system is the only source of skills needed for development.

Lastly human investment approach looks at the factors that determine the supply of skills and their utilisation within the framework of an economic analysis which the manpower approach does not. In fact it has to be pointed out that manpower approach does not try to envisage the demand for manpower in the economic sense of the term while the human capital investment approach tries to look at the determinants of the demand for skills in the economic sense of the term and thereby is more in keeping with the context of planning for economic growth.

INTERNAL ECONOMICS

So far we have been concerned with what might be called the external linkage of the educational planning with overall economic planning. Equally important is the internal economics of educational planning i.e. the aspects relating to the consumption of resources within the educational sector itself. The ques-

tion of the efficiency with which resources are consumed within the educational sector is as important as its linkage with overall planning. Therefore, we shall suggest some procedures which will improve the efficiency in the utilisation of resources in the educational sector.

TARGETS OF ENROLMENT

At present the practice of setting up targets of enrolment for one level of education as a whole is resulting in a great deal of difficulties. In particular it is noticed that while the so-called enrolment ratio of the relevant age group increases the number of those belonging to that age group who are out of the system also goes up. Thus for example while the enrolment ratio of the age group 6-11 goes up, those who belong to 6-11 left out of the system also goes up. This is because of the large number of children belonging to below 6 and above 11 age in the cycle.

It is also necessary to identify the children proceeding from one grade to the other on the basis of their social and economic origin. It is essential to take care of the egalitarian aspect of educational development. A second aspect is that the methods of projection of enrolment based on intake in grade I will have to be different from district to district. In these districts where enrolment is about to reach 100%, it is enough to take into account the rate of growth of population in the age group 6-11. The present method of projecting intake (or enrolment) on an aggregate basis has to be changed in favour of recognition of low intake in rural areas and the consequent need for a big drive for increasing enrolment.

The determination to vocationalise secondary education has been given expression to by several commissions before, but the problem seems to be evading a solution. One possible way out is to make a cost benefit study of vocational stream and find out the benefits arising from vocationalisation which can be taken as a guideline for vocationalisation. Another approach is to identify the avenues for employment that are newly emerging and vocationalise taking into account these avenues.

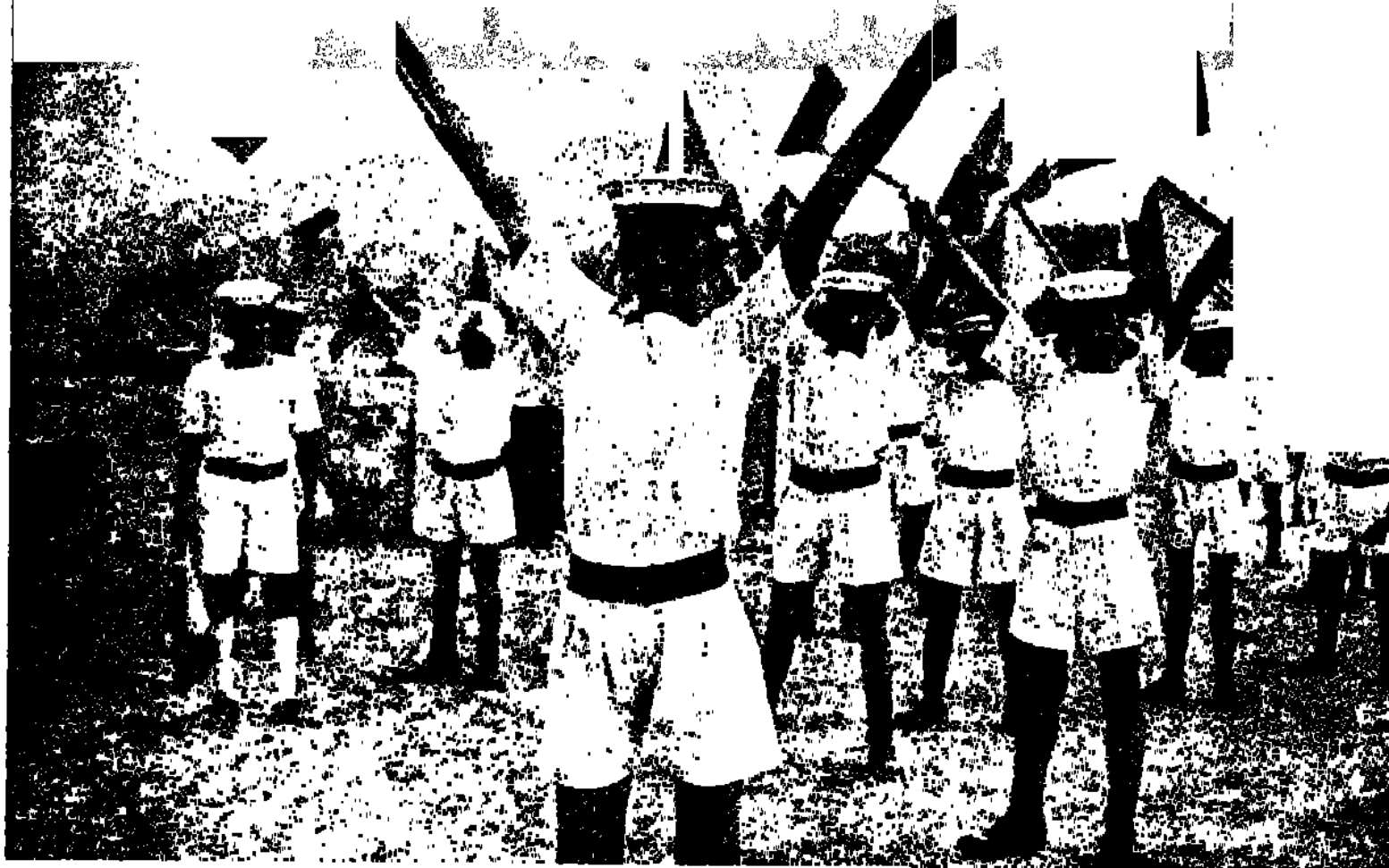
SELECTIVE ADMISSIONS

It is difficult to regulate entry into higher education unless we know enough about the motivations of students who take to it. Clearly it is profitable for them to do so and hence they aspire to enter into higher education though there may be a period of waiting involved. Vocational guidance and counselling and improved information about the labour market prospectus will have some effect in regulating entry into higher education.

At the second and third level of education there is need for improving efficiency in education by going in for a new kind of budgeting which will involve planning as well as programming.

■ ■ ■

Naval Wing of NCC



25 Years of National Cadet Corps

P.M. addresses N.C.C. Cadets

"IT IS the responsibility of the trained and educated youth to safeguard the country's freedom and fight against the enemy within and outside", said the Prime Minister, Mrs. Indira Gandhi while addressing NCC cadets from all over the country on the occasion of the 25th anniversary of NCC in Delhi recently. Freedom required constant vigil and alertness by a nation and one cannot afford to be complacent about it, she said and added, one has to safeguard it and make sacrifices for it. It is the responsibility of the youth, particularly to safeguard this hard won Independence.

Earlier Mrs. Gandhi distributed prizes to best cadets from different States. The best directorate banner was awarded to Tamil Nadu which won the maximum number of trophies.

On her arrival, the Prime Minister inspected a guard of honour presented by the three wings of the NCC—Army, Navy and Air Force. She also watched a mass PT display presented by over 1,300 school children of Delhi belonging to NCC's Junior Division. Cadets of the Air Wing gave flying display of aero modelling and Naval cadets presented a mock sea-battle.

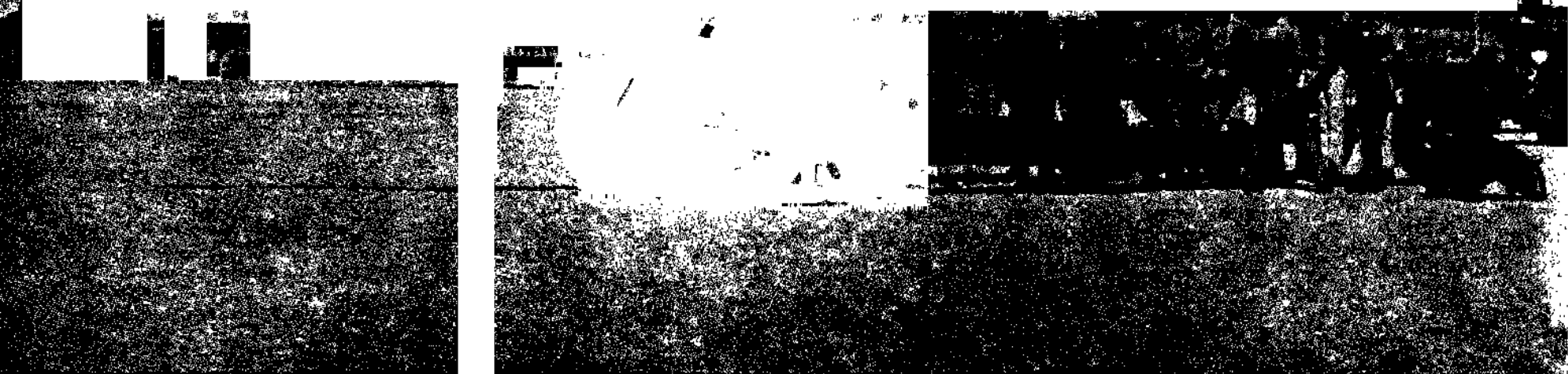
MAJOR GEN. B. M. BHATTACHARJEA

ESTABLISHED under an Act of Parliament and started in a small way in 1948 with an initial strength of about 38,305 cadets, today its strength has risen to 13 lakhs. Spread all over India there is hardly a town or a village with a school or a college without the NCC. The NCC got an inter-Service outlook in 1950 when an Air Wing was added to it, followed by the Naval Wing in 1952.

In 1949, the girls were brought in and by 1960, the demand for NCC units increased so much that it became difficult to meet the requirements. This led to a new form of training the students—by way of NCC Rifles.

NCCR units were merged with NCC units in 1964 as they were found redundant when the compulsory NCC Training Programme was introduced in 1963 following the Chinese aggression. But NCC training was again made voluntary in 1968 when the National Service Corps and the National Sports Organization—two youth schemes under the Ministry of Education—came into existence.

Not only the college students, but the young boys and girls in schools are also enrolled for the Junior Division. Here, they learn the basic requirements of upright bearing and are introduced to



a disciplined corporate living. The integrated programme is continued at the college stage where boys and girls are enrolled in different wings of the NCC in the Senior Division.

In its Silver Jubilee year the NCC is striving hard once again to establish itself as an indispensable youth organization and to provide an effective helping hand to educationists in training the country's youth—leaders of tomorrow.

NCC is neither a second line of defence nor a para-military force. It is in fact a youth movement based on schools and colleges.

Character-building and development of leadership in an individual is a continuous process. It begins from the childhood. By the time a child comes out of school, he has imbibed certain traits and characteristics which influence the subsequent shaping of his character. However, it is at the college stage that his personality takes a positive shape. This is the time when a sound, integrated educational programme can help him overcome his inhibitions, fears and diffidence.

The National Cadet Corps scheme is interwoven with the nation's educational programme. Through its multifarious activities, right from drill and squad training to Advanced Leadership Course, it strives to inculcate among the cadets qualities of leadership, citizenship and discipline.

At the first stage, basic training to the cadets is imparted on the rifle as is applicable to drill, weapon training and field-craft. Through this form of training, the cadets develop coordination of mind and body. Slowly and gradually, they learn to march in step and become responsible to the word of command.

At the second stage training is more advanced. For the Army wing cadets, there is weapon training and field-craft. The Naval wing cadets learn boat-pulling and sailing and the Air wing cadets, go up in gliders and obtain practical training in

powered flying. This enables them to get a student's pilot licence. The girl cadets get specialised training in signalling and first-aid.

The Junior Division cadets attend 150 periods, each of 40 minutes, in a year. Senior Division boys attend 120 periods in a year. Besides, Senior and Junior Division cadets attend annual training camps of 12 days and 10 days duration respectively. The prescribed training syllabus of cadets includes subjects like military history, military geography and defence service organisations.

Lectures on military history cover evolution of warfare and brief discussion on development of the Indian Army whereas those on military geography discuss friendly and belligerent neighbours, our resources, war potentialities, communications, frontiers and their influence on defence.

Every year centrally organised camps are attended by a large number of cadets from all the States. The aim of these camps is to achieve regional and social integration besides inculcating in them a spirit of adventure, comradeship, sportsmanship and the ideal of service. Camps are arranged in such a way that they are held in a place close to a regular Army unit a change from normal environment.

NCC officers and cadets now get an opportunity of attachment with Regular Army units for 21 days, both in peace stations and in forward areas. This makes them familiar with the life and training of the Jawans. This facility was availed of by 977 NCC officers and 5,256 cadets in 1973.

Para-training and para-jumps were thrown open to the NCC cadets for the first time in 1972. It meant more sophisticated training which hitherto was confined only to the selected volunteers of the army.

The para-jumping seems to have caught the imagination of the students and the results achieved have been good and encouraging. NCC plans to

increase the quota in 1974 to 140 as also extend the facility to girls. Cadets who exhibit keen leadership qualities and physical fitness are accorded facilities to attend basic and advanced courses at the mountaineering institutes at Darjeeling, Uttarakashi and Manali. These courses are very popular. NCC's Naval Wing now provides an opportunity for attachment to the Ship Training Establishment of the Indian Navy. This facility is available to selected cadets for a period of four weeks and helps them to acquaint themselves with the life in the Navy. An annual boat-pulling regatta on all-India basis known as 'INS NAU SAINIK' is also organised during a 14-day camp. Such camps are normally held at a sea port.

Besides the training in Air Force subjects, the Air Wing of the NCC provides varied and highly interesting experience in gliding, flying and aero-modelling. Twenty NCC officers and 200 cadets of the Senior Division are attached annually to Flying and Technical Air Force establishments for a period of four weeks. This enables them to gain first-hand knowledge of day-to-day activities of the Indian Air Force. An all-India Vayu Sainik Camp is held every year at an Air Force Station where 10 cadets from each of the 57 Squadrons attend. The best two cadets are sent every year to Singapore to attend the Annual Training Camp of the National Cadet Corps (Air), Singapore.

The Air Wing of the NCC participated in the First National Gliding Championship, obtaining fourth position. It also participated in the National Aero-modelling Rallies and Competition, winning a number of prizes.

Though vacancies in the three services are earmarked every year for NCC trained cadets, the NCC training is beneficial for wider employment as well. Dr. S. K. Sinha, a Bihar Government officer in 1966 carried out a research, the central theme of which was "Evaluation of NCC training in the development of leadership qualities among students". According to his conclusions the NCC cadets were better organisers, more dependable, more industrious, showed better interest and had greater self-confidence than those who had not undergone NCC training.

It is unfortunate that the NCC trained young men and women are not at present given preferential treatment as they should at the time of recruitment for service careers in the public and private sectors. These boys and girls are trained, disciplined citizens and I have no doubt in my mind that they will always prove to be better than others in all walks of life. We need cooperation from employers so that NCC becomes an attractive proposition in educational institutions.

We have to familiarise the potential employer about NCC and what NCC does for the all-round development of the youth is something which is to be put across to the potential employer. We have made a start this year by inviting a large number of them to come and see the finals of various competitions on 19 January at the Re-

public Day Camp. We also need the cooperation of the press for this.

NCC's Girls Division is showing commendable enthusiasm. Girl cadets get training in Signals, Map-reading, First Aid, Home-Nursing, Sanitation and Hygiene, Weapon Training, Civil Defence and Drill. In addition, four All-India Summer Training Camps, two Advanced Leadership Camps and Mountaineering Courses are conducted every year to provide opportunity to cadets from all over the country to live together. The training aims at providing opportunity to girl cadets to learn teamwork and develop initiative, resourcefulness leadership and self-reliance. NCC Lady Officers are also being employed on whole-time basis as Officers Commanding and Administrative Officers in lieu of Regular Army Personnel. Similarly Girl Cadet Instructors are employed on whole-time basis in lieu of JCOs and NCOs. Induction of these two cate-

13 Lakh NCC Cadets

THERE ARE three organisations functioning in educational institutions—National Service Scheme and the National Sports Organisation (under the Ministry of Education) and National Cadet Corps (under the Defence Ministry). N.C.C. was established in 1948 and following the confrontation with China in 1962, it was made compulsory in 1963 with the blessings of our then Prime Minister, Mr. Jawaharlal Nehru. More than 20 lakh khaki uniform sets were made.

During its 25 years of glorious existence its cadet strength now is about 13 lakhs as compared to 30,000 cadets in 1948. The expenditure on N.C.C. falls into three spheres—Central, State and joint. At present its expanded activities involve an estimated expenditure of Rs. 24 crores annually.

About 80 per cent of officer cadre of the NCC comprises teachers. These teachers were given permanent commissions in the NCC in 1963-64 when it was made compulsory and a battalion was created in almost every college.

gories of personnel has considerably improved the functioning of NCC Girls Division.

The NCC was assigned the task of contacting the next of kin of the Service personnel killed, wounded, or missing during the 1971 war. Officers and cadets of the NCC for the past few months visited widows and dependants of war victims all over the country. Their main task was to give full details of entitlements, benefits and concessions admissible to the families, under Central and State Government Schemes and to help them secure these expeditiously. Equally important is secure these expeditiously.

NCC cadets rendered valuable service last year when the country faced drought conditions in many areas and during the floods requiring relief measures on a vast scale in Gujarat, Maharashtra and Madhya Pradesh—the worst affected States.

In 1967 came into existence the NCC Officers' Training School at Kamptee followed by the inauguration of the NCC Academy at Purandhar in 1961 and the NCC College for Women at Gwalior in 1965. NCC Officers for the Naval and Air Force Wings of the NCC are trained by the Indian Navy and Indian Air Force at their Training Establishments.

NCC has quality requirements for the Permanent Instructional Staff PIS. It has 4,577 Junior Commissioned Officers and 10,336 Non-Commissioned Officers. Those who are obviously unsuitable are liable to be returned to their parent units. Here, I might mention that our methods of teaching must be re-oriented to suit the requirements of students as opposed to the service recruits.

The strategy of the NCC to achieve its targets is: (i) to recreate a favourable image of the NCC; (ii) to make NCC a fashion among students; (iii) to make its training interesting.

NCC has to build up an **esprit de corps** among its numerous categories of over 15,291 officers and instil in them a spirit of involvement in the Corps, also ensure that acts of indiscipline is not tolerated because we thereby forfeit the right to inculcate discipline in our cadets.

The task of the NCC is to introduce the youth of our country to the Services by giving them elementary military training and help in the development of their leadership qualities including sense of discipline.

Evaluation Body's Recommendations

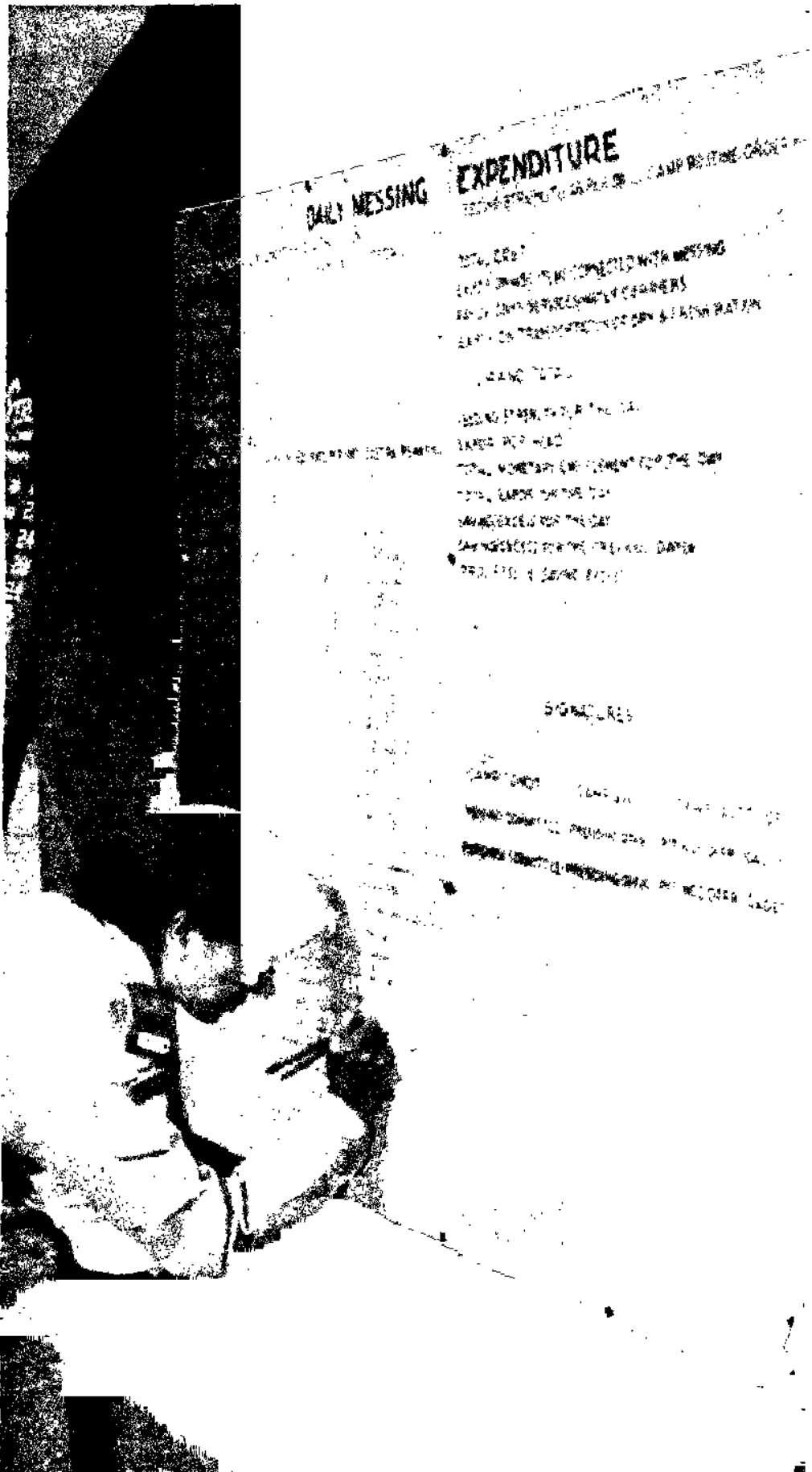
The following are the findings and recommendations of the NCC Evaluation Committee, which submitted its report to Union Defence Minister Jagjivan Ram on January 22 last. Dr. G. S. Mahajani, Vice-Chancellor, Poona University headed the Committee. The Committee was asked to evaluate the working of the NCC programme since its inception and to recommend measures necessary for changes in its aims and objectives, organisation and training.

THE COMMITTEE feels that NCC conti-

nues to be a live and active force fulfilling the aspirations of youth to a considerable extent.

The Committee recommends that the aims of the NCC be recast as under in view of the changed situation of India vis-a-vis our neighbouring countries and world situation in general:

- (1) Development of leadership, character, comradeship, spirit of sportsmanship and the idea of service.
- (2) To create a force of disciplined and



trained manpower which in a National Emergency could be of assistance in the defence of the country.

- (3) To provide training for students with a view to developing in them office-like qualities thus enabling them to obtain commission in the Armed Forces.

The Committee also considered the other two Organisations—NSS and NSO. It is of the view that the three Organisations i.e. NCC, NSS and NSO must be run separately and be not mixed up under one authority.

It is hoped, however, that the NCC will render, whenever approached by NSS and NSO, advice and the benefit of their experience, but it cannot be expected to divert its attention from its own duty of maintaining the NCC at a high level of efficiency.

The Committee felt that the academic instructions could be compressed within five days a week in the educational institutions and this view is already gaining popularity in the educational circles and the general public. The sixth day of the week could be utilised for imparting NCC training. This day will be called "Field Day" and it can be fixed on different days of the week in different educational institutions. This "Field Day" can commence with patriotic training for an hour followed by separate training for NCC NSS NSO.

The Recommendations about improvements to be effected in the NCC organisation to increase its efficiency are as under:

- (1) Enrolment should be made voluntary and also selective.
- (2) Strength of NCC Cadets:
 - (a) Senior Division—Reduction from the present level of six lakhs to four lakhs or even less on a gradual basis;
 - (b) Junior Division—To be maintained at its present level of 7,95,000.
 - (c) Girls Division—Junior Wing to be increased from 67,000 to 1,00,000 and Senior Wing from 61,000 to 75,000.
- (3) Good quality equipment in current use with Services must be provided to the NCC Units. 7.6 (SLR) should be introduced as early as possible.
- (4) Introduction of air rifles at places where the range facilities are not available as recommended to enable cadets to improve their weapon firing capabilities.
- (5) Heads of Institutions (Principals and Headmasters) should associate themselves closely with the NCC activities.

- (6) To create incentive among the cadets, following suggestions are made:

- (i) Attendance at any activity connected with the NCC should count towards the academic attendance as required by rules;
- (ii) Universities having Military Studies Department should offer military science as an elective subject open to NCC cadets;
- (iii) Vice-Chancellors be requested to consider if NCC 'B' Certificate could be included in the list of subsidiary elective subjects in the curriculum. Syllabus for 'B' Certificate be revised suitably;
- (iv) Government should consider issuing a directive to the effect, that other things being equal, NCC Certificate holders should be given preference in employment in Government service as well as public sector undertakings. We expect that private sector undertakings, also would give due weightage to NCC qualifications in view of the leadership qualities which they acquire through NCC training;
- (v) We hope that other things being equal preference will be given to NCC Cadets completing training successfully for admission to post-graduate and professional studies.

(7) Establishment—Officers

- (i) Only carefully selected Regular Officers should be posted to NCC;
 - (ii) Whole-time NCC Officers are to be gradually replaced by Regular Officers.
 - (iii) Part-time NCC Officers constitute the backbone of the NCC. Being academic men, they have considerable influence on the students. Therefore, suitable lecturers, that is regular lecturers of three years standing, should be selected for grant of NCC Commission on a part-time basis. They should be given intensive training before commissioning.
- (8) Direct entry facility to Junior Division NCC Cadets into National Defence Academy.
 - (9) Institution of long service medals ribbons for 5, 10 and 15 year of service rendered in NCC for NCC Commissioned Officers and NCC Cadet Instructors (Sergeant Major Instructors, Under Officer Instructors).

- (10) It is desirable that State Governments should delegate powers of head of department (both financial and administrative) to the NCC Directors. A few States have already delegated such powers to them.
- (11) NCC Directors should be of the rank of Brigadier or equivalent except in small States where he may be of the substantive rank of Colonel.
- (12) Group Headquarters is considered an essential link for command, control and coordination activities of the NCC Units. They must be provided with suitable light transport for making them effective.
- (13) NCC Battalions should comprise 3 to 6 Companies and the number of Junior Troops Attached to it should not exceed 12. Though it is desirable to form Junior Division Battalions, the same is not recommended in view of the present financial difficulties.
- (14) Company strength should be reduced from 200 to 160 and should comprise three platoons not exceeding 55 each. Company should have a Company Commander and one Company Officer (both part-time SD NCC Officers).
- (15) Junior Troops strength should be reduced from 100 to 60 and commanded by Troop Commander (Part-time JD NCC Officer).
- (16) Powers of punishment over Part-time NCC Officers.—It is desirable that NCC Directors are entrusted with powers to award 'displeasure' or 'severe displeasure' to part-time NCC Officers with a provision of an appeal to the Vice-Chancellors.
- (17) Units having poor attendance should be disbanded.
- (18) Refreshment allowance of 30 paise per hour per cadet for both Senior and Junior Divisions at present prices as against the present rate of 20 paise per hour per cadet is recommended.
- (19) Washing and polishing allowance is recommended at Rs. 2 per month per cadet for the training period both for SD NCC and JD NCC Cadets as against present rate of Re. 1 per month per cadet.
- (20) Honorarium for part-time NCC Officers to be payable throughout the year at the following scales in place of the flat rate of Rs. 75 per month per

SD NCC Officer and Rs. 50 per month as JD NCC Officers:—SD Officers 2 Lt. Rs. 75; Lt. Rs. 80; Capt. Rs. 90; Major Rs. 100; JD Officer 1st Officer Rs. 50; 2nd Officer Rs. 55; 3rd Officer Rs. 65; Chief Officer Rs. 75.

- (21) JD NCC Officers are not happy with their present designations. Government may examine changing the designations suitably.
- (22) Pay and Allowances—Sergeant Major Instructor Under Officer Instructors—Their emoluments should be improved. Their prospects to be further improved by selection and appointment of SD NCC Officers from among them.
- (23) Service conditions of permanent instructional staff serving with the NCC should be improved by providing for living accommodation compatible with their status and seniority in service to help them function efficiently.
- (24) Training—NCC Cadets
 - (a) Training programme should be made more intensive and realistic.
 - (b) Training be restricted to two years in JD and two years in SD, provision being made for third year training in SD NCC only for those opting to take up armed forces as a career, to enable them to pass 'C' Certificate examination.
 - (c) Camp training should be made an annual feature. In the training camps, NCC Cadets should be given some training in relief work so that they may be able to render service during natural calamities like floods, fire and famine.
 - (d) Para jumping should also be thrown open to girl cadets.
 - (e) Service attachment of girl cadets to Armed Forces Hospitals should be considered.
 - (f) Girls Division Training Syllabus should also include physical exercises, self-defence, unarmed combat, nursing and child welfare.
 - (g) Camp allowances should be raised so that boys and girls can be given adequate and nourishing food.



Work of a Coach in USSR

NINA SHKOLNIKOVA

THE Sportsman enjoys the highest moment of joy and triumph on the victory stand. Behind this, however, stretches a long road of training, and perhaps of failures and disappointments, a road traversed jointly by the sportsman and his coach.

The work of a coach is highly valued in the USSR for this is not merely the work of a sports specialist but also that of an educationist who has a direct influence on the moulding of the young man's character, his comprehension of his role and place in life. This noble and difficult profession demands of the trainer full devotion and inspiration. That is why when a sportsman emerges victorious at a USSR championship, diplomas are presented both to him and his coach. The names of the leading Soviet trainers are known throughout the country. Newspapers frequently carry stories about them, the title of Honoured Trainer of a republic or of the USSR is conferred on them, and their labour is marked by high awards, including state honours. Many of them are recipients of Government decorations.

Being a professional, the Soviet coach receives his pay from the club in which he is employed. The trainer is responsible to the club board, and in case his work is unsatisfactory he can be discharged in keeping with the general labour law, though true, only with the approval of the higher sports organisation the board is subordinated to.

The work of a coach in the USSR is remunerated in keeping with its quantity and quality. Higher pay is received by coaches in charge of USSR national teams or leading clubs, such as in ice-hockey or football, where special qualifications are required, than those working with novices and having lower qualifications and less work experience. True enough, besides the system of fixed salaries there exists also an hour-scale payment that does not take into account one's qualifications. Therefore, an experiment is being conducted now in a number of big cities of the Soviet Union to put in order the attestation of all coaches so as to make the pay of each one of them depend on their services, qualifications and successes achieved. The results of this experiment are being carefully studied.

There are about 50 million sportsmen in the Soviet Union. To provide all of them with an opportunity of training under the guidance of a qualified trainer

hundreds of thousands of specialists are needed, which also means a broad network of schools for training them and giving them advanced courses. Currently, there are about 300,000 paid workers in the Soviet sports organisations, the vast majority of whom are coaches. Moreover, with every passing year an ever greater number of specialists are being trained. This is done by 21 institutes of physical culture, 25 secondary schools of physical culture, 91 sports faculties at the teachers training schools, 10 schools for trainers and numerous other courses.

Training Schools

The secondary and higher schools of physical culture accept all young people finishing the 10-year school (eight years is sufficient for the former) passing the competitive entrance exam and having sports rating (usually second category), the standards of which are not very difficult to fulfil. Approximately the same are the requirements for enrolment



A Stbirkina, Honoured Trainer of Kazakhstan and gymnast V. Kucherova.

in the sports faculty of teacher training schools which train instructors of physical education for schools. Some of them also become coaches later.

It is difficult for the young man without any worthwhile record of success in sport to enrol in a school for coaches where, as a rule, noted sportsmen wishing to work in the sports sphere and educate the youth are preferred. But here too exceptions are possible, so that among the graduates of such schools also there may be people who have not shown high personal results in sport.

With the grand scale of the sports movement in the USSR a particular need is felt for specialists at the medium and lower links, who work in physical culture collectives at small enterprises and deal mostly not with sportsmen but with people making their first steps in sport. Recently, a new all-USSR physical culture move "Ready for Labour and Defence of the USSR" has been introduced, so that ever new

sections of masses, are drawn into taking up physical culture regularly. But they too need trainers, advisers with a knowledge of sport. And it is precisely in physical culture collectives, in the most mass scale link of the Soviet sport, that the biggest number of staff trainers with a higher or secondary special education are employed. But the demand for them is steadily growing so the public (volunteer, unpaid) instructors come to supplement them.

In the Soviet Union there are now more than three million public instructors, who are of tremendous help to the staff coaches in organising and conducting training and of competition.

By the way who is a public trainer?

As a rule he is a sufficiently talented sportsman, sometimes having the master's ranking, who likes to work with the novices, devoting his leisure, and free of charge at that, to this work. Usually he is helped in this work, and given advice by the staff trainer.

— — —

Delhi University Regain Baria Trophy

TEST ALL-ROUNDER Mohinder Amarnath, playing magnificently, enthralled the spectators at Patna in the five-day All-India University Cricket with 171 not out in the 1st innings.

Delhi University regained the prestigious Rohinton Baria Trophy defeating their rivals Bangalore University by an innings and 57 runs on the penultimate day of the five-day All India University Cricket final at Patna.

Rajeshwar Vats and Praveen Oberoi once again proved to be the mainstay of Delhi's attack.

The only hope for Bangalore was Everest D'Souza. The other batsman who contributed his mite was Imtiaz Ahmad. Prize distribution ceremony was held in the Wheeler Senate Hall at Patna.



Delhi University cricket team which regained the prestigious Rohinton Baria Trophy.

Round Up

Periodic Evaluation of Education Necessary

GIVING A CALL for a "periodic review and evaluation of the type of education in the context of the country's development and requirements," while delivering the Convocation Address of the Kurukshetra University, Dr. G.S. Dhillon, the Speaker of the Lok Sabha added that our constitution enshrines our social philosophy and it is in the context of this philosophy in practical terms that the review should be conducted. It is necessary for us to have a clear concept of our political, economic and social goals.

These days there was too much talk of vocationalised education. "This stress," he said, "should not be over emphasized, resulting in any imbalance. Education should not be such that it should make the students find life a tiresome monotony but it should create passion for things of mind" for a higher level.

"We should enable every scholar to take a living interest and pleasure in some kind of manual skill and our artisans, engineers and mechanics to be readers of the books other than those belonging to their trade. Only when we are able to attain such an equilibrium will education have served its true purpose. Then education will not cease with the University, but

would be a continuous process throughout life," he added.

Dr. Dhillon was of the view that a kind of a "brains trust" should be created in the Universities which may be "entrusted" with the task of scanning the latest books in different foreign languages and providing the teachers with synoptic notes to enable them to supplement their lectures. This will "bridge the gap temporarily," Dr. Dhillon said that we ourselves were making the position difficult by adopting the regional languages for even higher studies, thus shutting out the only link — English — which may to some extent supplement the knowledge of our teachers.

He lamented that educational centres unfortunately had lost a good deal of their aura of sanctity — sanctity of the things of the mind. Even professional institutions have failed to come up to expectations in this respect. He was of the view that some of the shortages the country faces today can be attributed to the fact that even our professional institutions have failed to turn out the right type of men to man our various developmental activities. They generally failed to grasp either the extent or

depth of the problems facing the country.

The University conferred the degree of Doctor of Laws on Dr. G.S. Dhillon for his illustrious contribution to "parliamentarianism, politics and administration."

UGC Chief Praises CIEFL Work

"THE CENTRAL Institute of English and Foreign Languages located in the city of Hyderabad is a fine example for an institution, maintaining very high academic standards, though specialising in a limited field," observed Dr. George Jacob, Chairman of the UGC, while delivering the Convocation Address recently at Millia Islamia, Jamianagar.

He pointed out that in view of the excellence in academic standards, the CIEFL was granted the status of a 'deemed' University so that it should have the liberty to confer its own degrees on its alumni. About the importance of 'deemed universities', he observed that such universities were not of lower academic status than a regular University. In academic depth, it must, if at all, be superior to a University though in academic range, it is bound to be much narrower than a university.

He stressed the importance of the development of large number of centres of excellence and said that an institution deemed to be a university should come into the quality sector of higher education.

Satish Chandra Pleads for Autonomy

THE RECENT expansion of college education in rural areas was phenomenal, and autonomy would help them improve their standard of education, said Dr. Satish Chandra, Vice-Chairman, UGC, while delivering the Convocation Address at Guru Nanak College, Kapurthala.

He strongly advocated provision of autonomous colleges in rural, as well as in urban, areas in

relation to the syllabus prescribed, in conformation to the economy of the area. The main hindrance in its introduction, he said, had come from Universities and could be removed only with the amendment of the Act.

Avoid Unproductive Projects—Reddy

A CLARION call to avoid wasteful discussions and unproductive projects and programmes was given by Sri M. Ramdev Reddy, Chairman, Board of Management, Andhra Pradesh Agricultural University (APAU) recently.

Mr. Reddy was delivering the twentyfirst Convocation Address at the Central Plant Protection Training Institute (CPPTI) at Rajendranagar.

He deprecated the attitude of many an extension worker to get bogged down in the so-called administration and not being able to help the farmers with the latest techniques of agriculture. Saying that it is high time that "we should avoid this tendency", he stressed the need of extending the latest agricultural knowledge, including the plant protection, in gaining higher yields per hectare in a unit of time.

Applauding the good work done at the Institute in training the personnel in plant protection from various States within the country and abroad, he also stressed the need to work out the cost benefit ratios and educate the farmers to produce more by adopting the latest techniques. "The knowledge gained at the Institutes and Agricultural Universities should be shared with the farmers," he said.

He advised the trainees to go out into the fields and help farmers understand these productive techniques.

Japanese Journalists Visit PAU

THREE Japanese journalists Mr Hideo Ishikawa, Director of

Brain Drain Loss to India

INDIA IS losing an estimated Rs. 23 crores annually due to brain drain, according to official figures.

Three thousand doctors, engineers & experts leave the country every year, according to a recent report of the Press Asia International.

The Government spends an estimated Rs 80,000 to train one MBBS doctor. The expenditure on other experts too is nearly the same.

This colossal brain drain leading to a staggering loss to the country is largely due to the appalling unemployment and underemployment conditions prevailing in India.

Though exact figures are not available, it is estimated that over 3,000 doctors and other experts go abroad annually for two to five years. A much large number of experts trained in India are always in foreign countries. Officials dealing with foreign exchange reveal that the doctors going to foreign countries do not even send substantial sums of money back home in foreign exchange.

International Relations, Japan Agricultural Journalists' Association, Mr Hitoshi Saito, International Affairs Department, Japan Newspaper Publishers and Editors Association and Mr Shoichi Yamamoto, Managing Director, The Toei Nippo Press, visited the Punjab Agricultural University recently to know the state of agriculture there. They went round the different departments of the University and also saw a well-run farm in a village,

Grant for Delhi University

THE GOVERNMENT of India has given approval to the grant of \$7,25,000 for Delhi University by the Ford Foundation.

A Delhi University spokesman said the amount would be spent on developing graduate level research and training in the University. The shopping list includes books and equipment for Chinese and Japanese studies departments, computer centre, health centre and other scientific laboratories. Modern equipment had also been ordered to replace the obsolete machines which were being used to run the University press.

Perspective on America

A THREE-DAY Lecture-discussion series on perspective on America was recently arranged at Sri Venkateswara University, Tirupati.

While inaugurating the lecture discussion series, Dr. D. Jaganatha Reddy, Vice-Chancellor, said, though primarily an agricultural country with rich pastures, agricultural and livestock farms in the U.S.A. has quickly evolved into world's greatest industrial country with increasing economic growth.

Further, he said, in the course of 50 years it has transformed into a great industrial country and the investment on rail, road and river valley projects through foreign loans have yielded heavy dividends. Dr. Reddy pointed out that the apparent quiescence of labour unions and the big turnover by the labour is a tribute to the nation's labour organisation.

While concluding his address, Dr. Reddy pointed out that global partnership alone can eradicate poverty, arrest population explosion, environmental pollution, famine of all type and for human total welfare.

Third Educational Survey

Eight States and three Union Territories have so far completed the training programme for the third educational survey, the biggest ever so far. Another five will be doing so this month to carry forward the survey programme, which will require the services of nearly four hundred specially appointed officers at the district level, besides State level officers.

Allocations totalling over Rs. 45 lakhs have so far been earmarked for the States for the school education component of the survey project which runs

the gamut of education in all its forms. The National Council of Educational Research and Training (NCERT), looking after the school education survey, is one of the five agencies involved in the overall project. The other four are the University Grants Commission (U.G.C.), for higher education, the Institute for Applied Manpower Research for vocational and technical education, the National Staff College, for educational administration and inspection, and the Department of Culture of the Government of India for cultural statistics.

The report will thus be at three levels—Central, State and District. It is expected to be completed by February next year.

Scope for Teachers in Algeria

COMITE Chretien de Service en Algerie, 60, Rue Larbi Ben M'Hidi, Algiers is on the look out for suitable foreign personnel as teachers in all fields of science and technology as well as English language. There is a great scope for such teachers in Algeria as it is planning to expand its higher education at its three universities—Algiers, Constantine and Oran. Other institutes of higher technical education in Algeria are also looking for foreign teachers. This organisation under the directorship of M. Jacques Blanc is engaged in assisting the Algerian authorities.

The media of instruction at the university level in Algeria being French, persons with a working knowledge of French are to be preferred. The universities can be contacted directly or through M. Jacques Blanc or the Minister of Higher Education and Scientific Research, Champ de Manoeuvres, Algiers.

Personal

1. Shri Gorachand Rath has taken over as Vice-Chancellor of Berhampur University w.e.f. February 11, 1974.
2. Dr. Shiv Mangal Singh 'Suman' has been appointed Vice-Chancellor of Vikram University w.e.f. February 5, 1974.
3. Dr. N. Prasad has been appointed Vice-Chancellor of Magadh University w.e.f. January 10, 1974.
4. Smt. M. Jayalakshammanni has been appointed Vice-Chancellor of Karnatak University.
5. Prof. K.A. Nizami has taken over as Vice-Chancellor of Aligarh Muslim University w.e.f. January 3, 1974.
6. Shri R.D. Sharma has been appointed Registrar of Kurukshetra University w.e.f. January 11, 1974.

FORM IV

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|---|---|
| 1. Place of Publication | New Delhi. |
| 2. Periodicity of Publication | Monthly |
| 3. Printer's name: | Anjni Kumar |
| Nationality: | Indian |
| Address: | Association of Indian Universities,
Rouse Avenue, New Delhi-1. |
| 4. Publisher's name: | Anjni Kumar |
| Nationality: | Indian |
| Address: | Association of Indian Universities,
Rouse Avenue, New Delhi-1 |
| 5. Editor's Name: | Anjni Kumar |
| Nationality: | Indian |
| Address: | Rouse Avenue, New Delhi-1. |
| 6. Name and addresses of individuals who own the newspaper and partners or share-holders holding more than one per cent of the total capital: | Association of Indian Universities,
(formerly known as Inter-University Board of India) Rouse Avenue, New Delhi-1. |

I, Anjni Kumar, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Sd/-Anjni Kumar
Publisher

March 1, 1974

Delhi University Students Group For Social Action

A STUDENTS voluntary group, having as its members, students from different institutions, known as Youth's Action was formed on October 2, 1969, the Gandhi Centenary Year with the specific intention to bring interested students together and channelise their energies in the constructive direction.

Youth's Action activities include holding work camps in villages during the vacations, wherein the student volunteers indulge in construction and repair of roads, improvement of sanitary conditions; providing medical aid to the needy; recreational activities for the children; informal talks with the village youth and the like.

Financed mainly by the membership fee and its publications, Youth's Action is establishing small Youth's Action units in the country for advancing the cause of Social Service. Besides, it has a 'Youth Information Centre' at the Office of the Group. In this Centre, arrangements for the interested students to know about youth activities in India and in other countries of the world exist.

It is holding an All India Essay Competition & Photography Competition '74 for the young.

New Horticultural Complex

PANTNAGAR HAS added still another first. It has established a new horticultural complex at an estimated cost of about Rs. 30 lakhs. Covering an area of about 250 acres, the new horticultural complex of Pantnagar University would be the first of its kind in any University. The new complex has the latest laboratories, glass houses, net houses, conservatory,

cold store and seed processing unit, etc.

The horticultural complex has already taken up production of quality seed of vegetables and disease-free saplings of fruit crops. The new complex has also an

ambitious plan to tackle such serious problems of national importance as malformation diseases of mango and die-back disease of citrus. The complex has already taken up steps to resolve various problems confronting successful vegetable production.

Mrs. Bandaranaike Visits Pantnagar Varsity

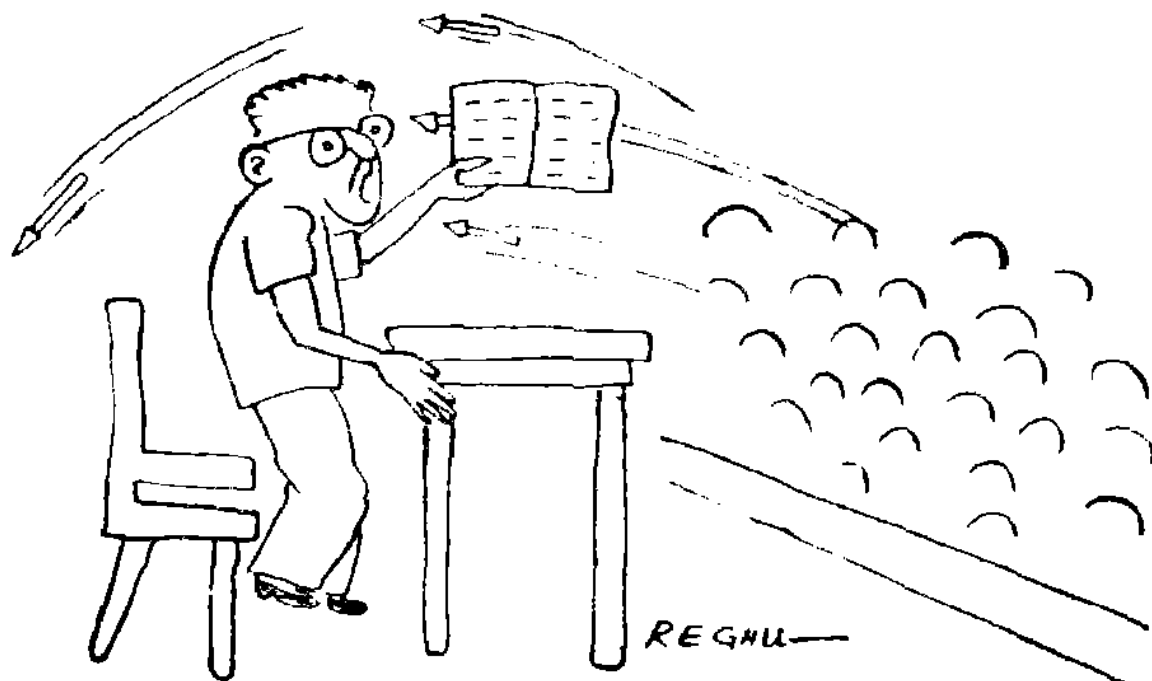
THE SRI LANKA Prime Minister, Mrs. Srimavo Bandaranaike, recently paid a visit to Agricultural University, Pantnagar. She visited various research stations and departments of the University. She evinced keen interest in the new varieties of wheat and pulses developed there. Mrs. Bandaranaike was particularly impressed by the rapid progress made in the adaptation of three new crops of soybean, sugarbeet and sunflower. She also made detailed enquiries about the Pantnagar seed project, which has transformed the entire Tarai area.

She was informed that Pantnagar is supplying quality seeds of high-yielding varieties not only to various parts of India but foreign countries as well. Mrs. Bandaranaike was impressed by

the quality of indigenously fabricated massive automatic seed storage bins at the seed processing plant there.

The Sri Lanka Prime Minister also showed keen interest in the ambitious 'Milk for Millions' project of the University.

Earlier in his welcome address, the Vice-Chancellor, Dr. N.K. Anant Rao, said that Pantnagar believed in uninhibited international co-operation in the field of research. He said the University is sharing its results and experiences with a number of countries. Pantnagar is also co-operating with the Government of Sri Lanka in developing pulses and soybean. He assured the visiting Prime Minister that the University would be ever ready to extend the area of co-operation.



Dear students, I withdraw my statement that your ideas should be always practical.

Library Staff in Varsities

THE SITUATION of the academic librarians specially the University Librarians in India has markedly changed. It is strongly realised that a well equipped, well stocked and up-to-date University Library is an essential and is the "Heart of University" for acquisition and advancement of knowledge.

Of all the factors that are responsible for the success of the Library in sharing the major part of various educational objectives, the human factor is the most important. Realising the importance, the University Education Commission under the Chairmanship of Prof. S. Radhakrishnan (1948), the UNESCO, the U.G.C. Library Committee under the chairmanship of Dr. S.R. Ranganathan in 1957, and the Education Commission (1965-66) under the chairmanship of Dr. D.S. Kothari, have recommended, assured and laid down the stan-

dards for University and college Librarians regarding their pay scales and status corresponding to those of Academic staff.

The U.G.C. determined certain standards or norms to be followed by the authorities of individual Universities for recruitment of Library personnel for the posts of Librarian, Deputy Librarian, Assistant Librarian and other professional staff.

Though the importance of Librarians and Libraries in University set-up had been emphasised from time to time by various Education Commissions in India they did not clearly recommend about the Research Facility to the Library Staff.

The U.G.C. Library Committee (India, 1957) recommended Ph.D. as desirable qualification but did not give guidelines to extend the facility for research to them in the Universities.

The provision of Doctoral

programme at the University of Delhi, Panjab University, Chandigarh and the Banaras Hindu University are providing facilities for Doctoral Programme leading to Ph.D. in Library Science. Only teachers in Library Science are registered in the above institutions.

But the Panjab University went a step further by providing this facility on part-time basis not only to personnel working in their University Library but also to personnel working in the University Libraries outside the State. The U.G.C. has to give directions in the matter to various Universities in the country where U.G.C. scales of pay are implemented to follow a uniform pattern, so as to realise that the Library is an integral part of University.

K. LAZARUS

Dr. V.S. Krishna Memorial
Library, Andhra University
Waltair.

INDIAN SCHOOL OF MINES

DHANBAD-826004

Entrance Examinations for Admission to three-year Condensed B.Tech. Degree Programme in Mining Engg. 1974.

Indian School of Mines, Dhanbad a deemed university offers programmes of study leading to the B.Tech. degrees in Mining Engg./Petroleum Engineering/B.Sc. (Hons)/M.Sc. in Applied Geology, B.Sc./M.Sc. in Applied Geophysics, M.Tech./M.Sc. in Mining Engineering/Petroleum Engineering and Ph.D. in all disciplines.

The Institute now invites applications for the Entrance Examination for admission to the Three-year Condensed programme leading to the B.Tech. degree in Mining Engineering. The Examination will be held on May 17 and 18, 1974. The session will commence on July 1, 1974.

Likely examination centres : Chindwara, Dhanbad, Kodarma Kolar Gold Field (Karnatak), Raniganj, Singareni and Udaipur.

Special coaching classes for the entrance examination will be organised at Dhanbad between April-May 1974. A special fee will be charged for attending the coaching classes. Persons interested in the coaching classes should apply to the Registrar **before March 15, 1974.**

Qualifications required : Pass in Higher Secondary or equivalent examination and a Diploma in Mining with at least three years industrial experience. Sponsored candidates preferred.

Prescribed application form and Memorandum of Information may be obtained on payment of Rs. 3.00 (application form Re 1/- plus postage etc. Rs. 2.00) by Money Order payable to Registrar, Indian School of Mines, Dhanbad-826004.

Postal orders will not be accepted.

Applications in the prescribed form complete in all respects should reach the Registrar, Indian School of Mines, Dhanbad 826004 by **March 31, 1974**

CURRENT DOCUMENTATION IN EDUCATION

A list of select articles culled from periodicals received in the AIU Library during January-February 1974.

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1. Bakshi, Kiran. Microanalytical evaluation of metal ions using organic reagents and potassium thiocarbonate. University of Delhi.
2. Bhattacharjee, Saibal Kanti. Studies on the preparations, reactions and structure of ortho-mercapto-azo compounds. University of Gauhati.
3. Handa, Avinash Chander. Micro-analytical techniques in inorganic analysis. University of Delhi.
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5. Komerwar, A.M. Some aspects of the surface properties of some hydrous oxides. Jabalpur University.
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7. Mehta, P.R. Study of corrosion in chemical industries and its prevention. Saurashtra University.
8. Sharma, Krishan Kumar. Unrestricted Hartree-fock study of π electron spin density and charge density distributions in some conjugated systems. University of Delhi.

Earth Sciences

1. Devendra Pal. Geology of the area around Naini Tal, District Naini Tal, U.P. M.S. University of Baroda.

Engineering Technology

1. Mishra, Brahma Nand. Synthesis of N-Port RC networks. University of Delhi.

BIOLOGICAL SCIENCES

Biochemistry

1. Garg, Shankar Lal. Electrophoretic studies of proteins

and other chemical constituents of plant cancerous tissue. Indore University.

2. Nageshwar Rao, Y. Studies on some leguminous seeds. Jabalpur University.

3. Nirmala. Studies on enzymes and ureide metabolism and the photochemistry of ureides and purines. Osmania University.

Botany

1. Fouzdar, Aparajita. Cytotaxonomic studies in some members of the Leguminosae. University of Delhi.
2. Manohara Chary, Ch. Investigations on the microbial ecology of pond waters, muds and soils of Hyderabad District, A.P. Osmania University.
3. Nanda, Kanan. Structure, development and function of anther tapetum. University of Delhi.
4. Saxena, Arjun K. Studies on some aspects of Indian palynology. Jabalpur University.
5. Umabala, K. Physiological studies of *Phytophthora palmivora* and *Leptosphaerulina trifolii* occurring on *Colocasia esculenta*. Osmania University.
6. Usha. Studies on *Sclerotium rolfsii* SACC., causing foot and root rot of wheat. Osmania University.

Zoology

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Medical Sciences

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SOCIAL SCIENCES

Psychology

1. Desai, Ilaben Bipinchandra. A study of child life in an urban community with special reference to maternal attitude: A psychological analysis. Sardar Patel University.
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affecting job satisfaction of engineering teachers. I.I.T., Delhi.

Political Science

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Economics

1. Saini, Narayan Prasad. Forest wealth and its utilization in M.P. Indore University.

Law

1. Raja, C.K.N. A comparative study of the freedom of speech and expression in the constitutions of India and United States. Karnatak University.

Public Administration

1. Abdul Aleem. Management of public personnel in Andhra Pradesh. Osmania University.
2. Unipathy, N. Board of Revenue in Andhra Pradesh. Osmania University.

Commerce

1. Paul, Amiya Kumar. Tea industry in Cachar. University of Gauhati.

Education

1. Pandya, Nalini Laxmanrao. A study of the effectiveness of programmed learning strategy in learning of physics in Xth class of secondary schools. Sardar Patel University.
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HUMANITIES

Philosophy

1. Masilamani, A.B. The Hindu Christian concept of non-violence. Osmania University.
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3. Nag, Tripti Kana. Science, language and metaphysics: An enquiry into a reorientation of metaphysics in the light of contemporary philosophy of science. Visva-Bharati.

Music

1. Shukla, Shatrughan. Thumari ke utpati, vikas aur shailiyan. University of Delhi.

LITERATURE

English

1. Rama Krishna Rao, V. Ivy Compton-Burnett: A critical study. Andhra University.
2. Sreeramachandra Murthy, K. Raja Rao; A critical study. Andhra University.

Sanskrit

1. Dwivedi, Reva Prasad. Sanskrit kavyashastra ka ek adhyayan (dhwanyasank tatha vimershini ke vishesh sandardh mein). Jabalpur University.
2. Kamal. Heer sobhaghyam vivechnatmak adhyayan. Kanpur University.
3. Pandey, Ramanand. Sanskrit ke pratinidhi arihasik natkon ka samalochnatmak adhyayan. Jabalpur University.
4. Trivedi, Vijay Lakshmi. Harshcharit evam Shivraj Vijay ka tulnatmak tatha samikshatmak adhyayan. Kanpur University.

Hindi

1. Anand, Kamlesh. Sudarshan ke kahaniyon ka alochnatmak adhyayan. Kanpur University.
2. Annapurna G. Hindi aur Telugu ke nitimuktikon ka tulnatmak adhyayan. Dakshina Bharat Hindi Prachar Sabha, Madras.
3. Bhalla, Vineeta. Silappadikaram aur Padmavat ka tulnatmak adhyayan. University of Delhi.
4. Bhatnagar, Susheela. Prabhavavadi alochana aur us mein Shri Shantipriya Dwivedi ka yogdan. Dakshina Bharat Hindi Prachar Sabha, Madras.
5. Dwivedi, Krishna Prasad. Swatantrya sangram mein Kanpur janpad ke sahityajaton ka yogdan, sa 1920 se 1947 isvi tak. Kanpur University.
6. Jain, Kiran. Itikateen Hindi Jain kavya. Jabalpur University.
7. Manorama, V. Hindi aur Malayalam ke swachandavadi kavyadharaon ka tulnatmak adhyayan. Dakshina Bharat Hindi Prachar Sabha, Madras.
8. Mittal, Mridula. Arthv Ved ke varnya vishaya ka vigyanik paryaavekshan. Kanpur University.
9. Nathuni Singh. Apbhramsh aur Hindi ke kavya rupon ka tulnatmak adhyayan. Magadh University.
10. Pandey, Bagesh Dutt. Madhya yugeen Hindi bhakti kavya ke sandharbh mein Vaishnav Sampradayan ka tulnatmak adhyayan. D. Litt. Kanpur University.
11. Prema, V.K. Hindi kavya mein swappan. Dakshina Bharat Hindi Prachar Sabha, Madras.
12. Rama Naidu, K. Hindi evam Telugu ke pragvadi kavya dharaon ka tulnatmak adhyayan. Dakshina Bharat Hindi Prachar Sabha, Madras.
13. Saroj. Adhunik Hindi prabandh kavyon mein kavysamaya tatha kathanak rurjan, 1900—36. University of Delhi.
14. Umarani, K. Dakshin ke Hindi sahitya ka alochnatmak arihas. Dakshina Bharat Hindi Prachar Sabha, Madras.
15. Vaid Adhir, Inderraj. Manavtavad ke paripekshya mein swantrayottar Hindi kavya ka samikshatmak adhyayan. Dakshina Bharat Hindi Prachar Sabha, Madras.
16. Vatsala, K. Mahadevi Verma ke kavya mein prakriti ke vividh rupon ka samikshatmak adhyayan. Dakshina Bharat Hindi Prachar Sabha, Madras.

Urdu

1. Ansari, Abdul Hafiz. Development of Urdu short stories in Bihar. Magadh University.
2. Syed Alay Ahmad. Urdu gazal aur Shad Azimabadi ka fun. Magadh University.

Persian

1. Siddiqui, Najma. Persian language and literature during the Qutb Shahi reign 1518 A.D.-1687 A.D. Osmania University.

History

1. Sinha, Binod Chandra. India in the time of the Sungas. Kurukshetra University.

Training of Teachers in Indian Languages

Applications are invited from qualified teachers for admission to the ten-month training course in Indian Languages at the undermentioned Regional Language Centres of the Central Institute of Indian Languages. The course will commence in the first week of July '74 and will be over on April 30, '75.

1. For **Kannada, Tamil, Telugu and Malayalam** : Southern Regional Language Centre, Manasagangotri, MYSORE (Karnataka)
2. For **Assamese, Bengali and Oriya** : Eastern Regional Language Centre, Laxmisagar, BHUBANESHWAR (Orissa).
3. For **Gujarati, Marathi and Sindhi** : Western Regional Language Centre, Deccan College, POONA (Maharashtra).
4. For **Kashmiri, Panjabi and Urdu** : Northern Regional Language Centre, Panjabi Bhavan, Panjabi University Campus, PATIALA (Punjab).

QUALIFICATIONS : Candidates should (1) be Graduate (or equivalent) teachers in government/semi-government service, (2) have a minimum second class Bachelor's degree (or its equivalent), (3) have 5 years' teaching experience, (4) be below 35 years of age, and (5) should not have any previous knowledge of the language applied for.

Preference will be given to language teachers and Social Studies teachers with aptitude for language learning.

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During the Fourth Five-Year Plan, after the successful completion of training, the teachers were allowed Cash Allowance equal to two advance increments for the period they taught the language to a minimum of ten students. The continuance of this incentive during the Fifth Five-Year Plan is under active consideration of the Government.

Candidates should submit their applications through proper channel (the DPI of the State in which the teacher is serving) so as to reach the undermentioned address by **25th March, 1974.**

Director

CENTRAL INSTITUTE OF INDIAN LANGUAGES
(Ministry of Education & Social Welfare, Government of India)
Manasagangotri, MYSORE—570006

davp 511 (128)/73

NEW TEXT-BOOK IN ENGLISH FROM THE U.S.S.R. AVAILABLE IN INDIA

1. **Machine Tool Design (Vol.2), Editor. N. Acherkan, D.Sc., pp. 380, Rs.7.25 (Mir Publishers, Moscow).**

Volume 2 of the fundamental work Machine Tool Design contains parts 3 and 4. The complete work is to be published in four volumes.

Part 3 deals with the kinematics of machine tools. This branch of machine tool design has been systematised by the author and is set forth with exceptional clarity. The kinematic structures of different types of machine tools, including the most complex gear-cutting machines, have been analysed by methods developed in the text which take into consideration the relations between the workpiece to be produced by the given machine tool, the cutting tool to be used, the selected processing method and the kinematic structure of the machine tool.

Part 3 has been written by Professor A. Fedotyonok, D.Sc. (Eng.), whose investigations in the field are well known to all Soviet machine tool designers.

Part 4 deals with hydraulic drives of machine tools. It contains all the theoretical and practical data required for the application of fluid power and control systems to machine tools. This part has been written by Associate Professor V. Yermakov, candidate of Eng. Sc., who lectures on the subject at the Machine Tool Engineering Institute in Moscow.

This fundamental four-volume work has been written by scientists and specialists in machine tool design and edited by Prof. Acherkan, author of over 50 scientific works and textbooks in this field. He holds the title of Honoured Scientist of the Russian Federation and has occupied the Chair of Machine Tool design for 35 years. He graduated from the Warsaw University in 1914, where he majored in mathematics. He received a gold medal for the work done by him in the university. In 1920, he received a second degree from the mechanical engineering department of the Petrograd Polytechnical Institute.

2. **Problems in Calculus of One Variable, I.A. Maron, pp. 455 Rs. 8.75 (Mir Publishers, Moscow).**

Most the sections of this book contain brief theoretical introductions and solutions of typical problems.

They also contain problems to be worked out without the assistance of a teacher. Apart from problems of an algorithmic-computative nature, the book includes many problems aimed at illustrating the theory, facilitating its thorough understanding, and at the same time developing the mathematical outlook of the student. The book aims at helping students

solve problems of mathematical analysis (the theory should be studied with the help one of the available text-books).

The book is meant for students of technical higher schools.

It may also prove to be useful to people who wish to recapitulate the course of mathematical analysis and improve their knowledge in the field.

The author of this textbook—Isaak Maron, candidate of Physical and Mathematical Sciences, Assistant Professor—has for several decades been lecturing to students of higher educational institutions on calculus. He is also the author of a number of textbooks and manuals on mathematical analysis and computational mathematics.

In cooperation with other authors, he has compiled a two-volume manual on computation mathematics (Vol.1: Computational Mathematics and Vol. 2: Numerical Methods of Analysis). He has also written Computational Mathematics: Examples and problems in collaboration with N. Kopchenova.

Isaak Maron's investigations into the history of mathematics are widely known and are highly appraised by specialists.

LEARNING RUSSIAN

3. **Verbs of Motion in Russian, pp. 285, Rs.4.30 (Progress Publishers, Moscow)**

This book is designed for English-speaking students of Russian, who have worked through an elementary course of Russian and wish to continue their study of the language with or without the help of a teacher.

The book aims at helping the student to grasp one of the most important elements of Russian grammar—the so-called "verbs of motion" and to illustrate the way they function in modern Russian.

Verbs of Motion in Russian consists of two parts which differ from each other both in their content and length.

Part I contains exercises arranged according to a definite system. These exercises will help the student not only to understand the meaning and uses of the Russian verbs of motion but will also give him an opportunity to use them in speech, if his aim is to master spoken Russian.

Part II contains texts (excepts from the works of literature) which incorporate verbs of motion and pictures which illustrate their different uses. These texts and pictures aim at enabling the student to analyse the meanings and uses of verbs of motion on the basis of the knowledge gained from the

material studied in Part I and to develop his oral speech habits.

4. Russian as we speak It, S. Khavronina, pp.260 Rs.3.15 (Progress Publisher's, Moscow)

In preparing the present volume it was the author's intention to primarily provide a course in Russian for persons in the English-speaking world who are studying the language without a teacher.

It is, however, so devised that it may equally well be used under the guidance of a tutor. It is intended for students who have reached an intermediate level after studying N. Potapova's Russian, or a similar textbook.

The book is entirely practical and the material it provides is contemporary and frankly utilitarian. It consists of nineteen lessons, each one of which deals with a particular aspect of everyday life in the Soviet Union today.

Each lesson consists of a passage for reading and a set of dialogues on a specific theme, followed by notes and exercises.

The passages are given in order of increasing difficulty as regards both subject matter and language. However, as the grammar and syntax do not vary greatly in difficulty from one lesson to another, this order need not be strictly adhered to.

The notes deal mainly with points of grammar, syntax and vocabulary, which present difficulty to foreign students of Russian.

Each lesson contains a section entitled "Memorise", in which certain common expressions are given. It is recommended that they should be learnt by heart.

A comprehensive Russian-English vocabulary is given at the end of the book.

5. Inorganic Chemistry, N. Akhmetov, pp. 570. Rs. 10.60 (Mir Publishers, Moscow).

The textbook is intended for students studying chemistry at special colleges and universities. It is a book with a rather different approach with regard to the material presented as well as the mode of presentation.

The book aims at acquainting the student with the basic concepts and the most important laws and theories in inorganic chemistry.

Considerable space is given to contemporary views on the structure of matter and the theory of chemical bond.

This textbook is divided into two parts. Part I is a theoretical introduction to inorganic chemistry. Part II presents a detailed survey of the elements and the most important chemical compounds.

The book will also be helpful to chemical engineers.

The textbook is richly illustrated.

6. Problems in General Chemistry N. Glinka, pp. 270, Rs. 6.20 (Mir Publishers, Moscow).

This textbook is intended for students who study chemistry independently or by correspondence. It contains over 850 problems and exercises related to various sections of general chemistry.

Each chapter provides at the beginning sufficient theoretical material and sample solutions of typical problems which will help the student in solving problems and in their future practical applications.

After graduating from the Moscow University in 1908, Nikolai Glinka did research for several years under N.D. Zelinsky. But he preferred teaching to research and took his doctorate in that field. After teaching chemistry for 12 years in Podolsk, he was transferred to Moscow in 1924 by the People's Commissariat of Education. In 1940 he was appointed Head of the Chair of Inorganic and General Chemistry at the All-Union Polytechnical Correspondence Institute, a post he held to the end of his life.

Prof. Glinka's first textbook Inorganic Chemistry, published in 1930, was reprinted five times. General Chemistry first appeared in 1940 and has had 14 Russian editions. Another textbook by Prof. Glinka, widely used in colleges, is problems in General Chemistry. It has had 19 Russian editions and has been translated into several languages.

RECOMMENDATION

The following Soviet textbooks have been approved by the Indo-Soviet Textbook Board for use as textbooks by Indian students. Their translation into Indian languages is recommended.

(a) Differential Equations and Calculus of Variations by E.L. Elsgotts.

(e) A course on Theoretical Mechanics (Vol. II) by Yablonsky and Nikiforova.

These books are available with booksellers throughout India and definitely with the following distributors of Soviet books in India :

People's Publishing House (P) Ltd

Rani Jhansi Road, New Delhi-55

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190-B, Khetwadi Main Road, Bombay-4

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Piramshah Manzil, Relief Road

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Candidates selected would be offered position depending upon their academic background and relevant teaching/research/professional experience. Higher initial pay will be admissible to specially qualified and deserving candidates. Outstanding candidates for the position of Professor may be fitted in the senior scale viz. 1600-100-1800. The position of Associate Professor is to be filled on contract for a period of 1 to 3 years.

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Indian candidates abroad, if selected for appointment, are allowed travel grant contribution limited upto a maximum of

economy class air-fare for self and family provided they undertake to serve the Institute for a period of 3 years, after joining.

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Professor : First Class Master's Degree/Doctorate Degree in appropriate field with minimum 7 to 10 years' distinguished experience in teaching/research in Institution of University standard at Postgraduate level. Specialised knowledge in one or more specified fields with experience in guiding research. Professional/Scientific work of outstanding merit would be preferred.

Assistant Professor : First Class Master's Degree/Doctorate Degree in appropriate field with a minimum of 5 years' experience in teaching/research in Institution of University standard. Specialised knowledge in one or more specified field/subject with outstanding teaching/research experience and Doctorate Degree or published work of equal standard would be preferred.

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S. S. O. Gr. II : (PL-480 Scheme-temporary) Control Systems & Power Systems.

The Department has active research group in the fields of Electrical Machines, Power Systems, Control Theory & Systems, Network Theory and Solid State Circuits, Communication Theory & Solid State Circuits and Communication Theory and Systems.

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The Department is being developed in three broad areas : Production & Industrial Engineering, Thermal Engg. & Mechanical Engineering, Design & Analysis. Research and Development work is in progress in all fields in the above areas.

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Asstt. Prof./Lectr. : Textile Chemistry/Textile Technology/Fibre Science. **Broad areas :** Textile Technology : Weaving, Knitting, Texturization, Textile Management and Operations Research. **Textile Chemistry :** Finishing and Dyeing of Natural and manmade Fibres, Chemical modification of Fibrous materials.

Fibre Science : Manmade Fibre Production, Structure & properties of Fibrous materials.

Candidates with First Class Master's Degree or Ph. D. in Chemistry or Physics with requisite experience in appropriate fields are also eligible to apply.

The Department has good facilities and equipment for research. Selected candidates would be required to undertake Postgraduate teaching and research. Research is already in progress in the field of Fibre Science, Textile Engineering and Textile Chemistry. Department is running courses in Textile Chemistry, Textile Technology and Textile Engineering at Undergraduate level and Textile Engineering and Fibre Science and Technology at Postgraduate level.

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devices, Lattice Dynamics, Mossbauer Spectroscopy, Transport Phenomena in Semi-Conductors, Thermal Conductivity.

The Department runs M. Sc., M. T. ch. and Ph. D. programmes and has research activity in the areas of Theoretical Plasma Physics, Quantum and Statistical Optics, Lattice Dynamics, Solid State Devices, Integrated Circuits, Thin Films, Crystal Growth, Electrets, Raman Spectroscopy, Mossbauer Spectroscopy and Applied Optics.

HUMANITIES & SOCIAL SCIENCES DEPARTMENT

Professor

Field of specialisation : (a) Applied Linguistics with reference to English/Teaching of English as a Second Language linguistics with reference to English (b) Corporate Strategy and Business Policy/Marketing/Environmental Analysis and Management information System/personnel Management and Labour relations.

The Department runs a five-year programme as an integral part of the B. Tech. Engineering curriculum, covering areas of language and communication, social sciences and management. At the M. Tech. level, the Department offers advanced courses in areas like 'Management Science' and 'Human Factors in Engineering'. At the level of research, the Department offers doctoral and post-doctoral programme encouraging research in areas like (1) Applied Linguistics, Language behaviour and Software of Language Laboratory (2) Modern Literature (3) Managerial Decision-making, Organisational Behaviour and Organisational Analysis (4) Small Group Research (5) Technology and Social Change and (6) Education and Society.

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ADMINISTRATION

Deputy Registrar

Qualifications & Experience : Essential : (i) Degree in Arts, Science, Commerce, Engineering Technology or Business Administration (ii) Considerable administrative experience of general administration in a responsible position in a University or Residential Teaching Institution having student population of 1000 - 2000, or autonomous Public Undertaking or Business Organisation of repute (iii) Experience in dealing with admission of students, conduct of examinations on a large scale, conduct of faculty and other academic body meetings including procedure thereof, Preparation of Agenda, Minutes etc. OR Suitable experience in general administration including staff recruitment, establishment, budget, office security, stores and accounts management. Knowledge of Government rules and regulations relating to the above subjects, office procedure, secretariat work of Committees including agenda and minutes (iv) Capacity to develop corporate life within residential institution (v) (a) Should have wide sympathy with students (b) Teaching and research experience (c) Sportsmanship.

Assistant Registrar

Qualifications & Experience Essential : (i) Degree in Arts, Science, Commerce or Business Management (ii) Must have good knowledge of procedure of general administration or accounting of cash and other transactions preferably both and be able to draft reports and minutes of conferences. (iii) At least 10 years' experience in a responsible position under Government or in a large educational institution or business organisation of repute.

Desirable : Experience of supervision of examination work, student welfare work, proved capacity to understand students and their problems.

Assistant Registrar (Stores)

Qualifications & Experience : Essential : Degree in Arts or Science or a National

Certificate in Electrical/Mechanical Engineering. Diploma in Business Management or equivalent preferable. Seven years' experience in purchasing engineering stores, some knowledge of store keeping and management and workshop experience.

Prescribed application forms may be obtained from the Registrar, Indian Institute of Technology, Delhi, Hauz Khas, New Delhi-110029 either in person or by sending a self-addressed stamped envelope (11"x20" size) bearing postage stamps of the value of 20 paise. Candidates from abroad may apply on plain paper giving an account of their academic and professional record, reprints and publications and names of at least two persons

well acquainted with their professional work. Candidates selected for appointment will be required to join duty immediately or as soon as possible thereafter.

Last date of receipt of request for application forms 14th March, 1974.

Last date of receipt of completed application forms together with an Indian Postal Order of the value of Rs. 7.50 (Rs. 1.87 for SC/ST)—21th March, 1974.

(5th April 1974 in the case of candidates from abroad)

SAMBALPUR UNIVERSITY JYOTIVIHAR, BURLA

ADVERTISEMENT

No. 7684/TDS.

Dated the 28.2.74

Name of the post :
Professor of Biological Sciences (One post).

Nature of the post :
Permanent

Scale of pay :
Rs. 1100-50-1300-60-1600

Age of retirement :
(a) Sixty years

(b) A Professor may also be appointed on contract basis for a period of five years or till the attainment of sixty years of age whichever is earlier, in case of suitable candidates.

Essential Qualifications :

- i. At least a Second Class Master's Degree in Biological Sciences, Botany or Zoology with 40% marks.
- ii. High research qualifications preferably a Doctorate

iii. Capacity for conducting and guiding research work

iv. Teaching experience for at least ten years' in a college or University with at least five years' experience in teaching Post-graduate classes.

v. Specialisation in one or more of the following fields :

1. Plant Physiology
2. Bio-Chemistry
3. Animal Physiology
4. Environmental Biology
5. Genetics
6. Biophysics
7. Microbiology

The post carries usual dearness allowance as would be sanctioned by the University from time to time.

Seven copies of application forms will be supplied from the University Office to

each candidate in person on cash payment of Rs. 2/- (Rupees two) only. Candidates intending to get application forms by post are required to send (a) crossed Postal Order of Rs. 2/- payable to Finance Officer, Sambalpur University, (b) Self addressed envelope (23 x 10 Cm.) with postage stamp worth Rs. 2/- affixed to it with the words "Application form for teaching posts in Sambalpur University" Superscribed on it. Money order/Cheque will not be entertained.

The last date of receiving application in the office of the University at Jyotivihar, Burla, Dist. Sambalpur (Orissa) is the 31st March, 1974. The candidates shall be required to appear at an interview before a Selection Committee at their own expense.

All communications should be addressed to the Registrar by designation only.

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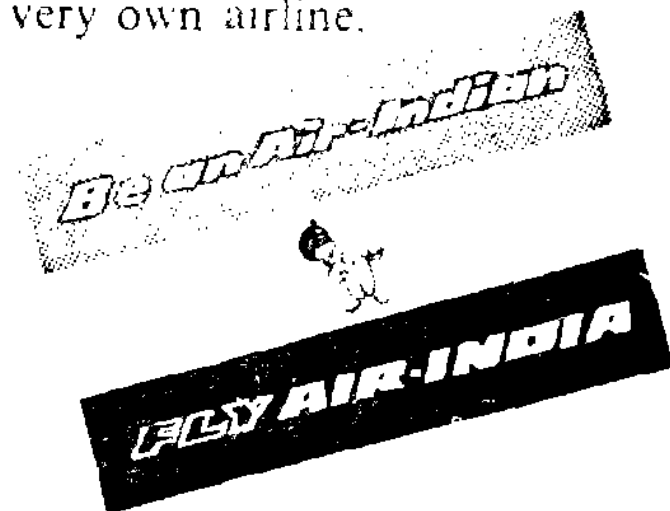
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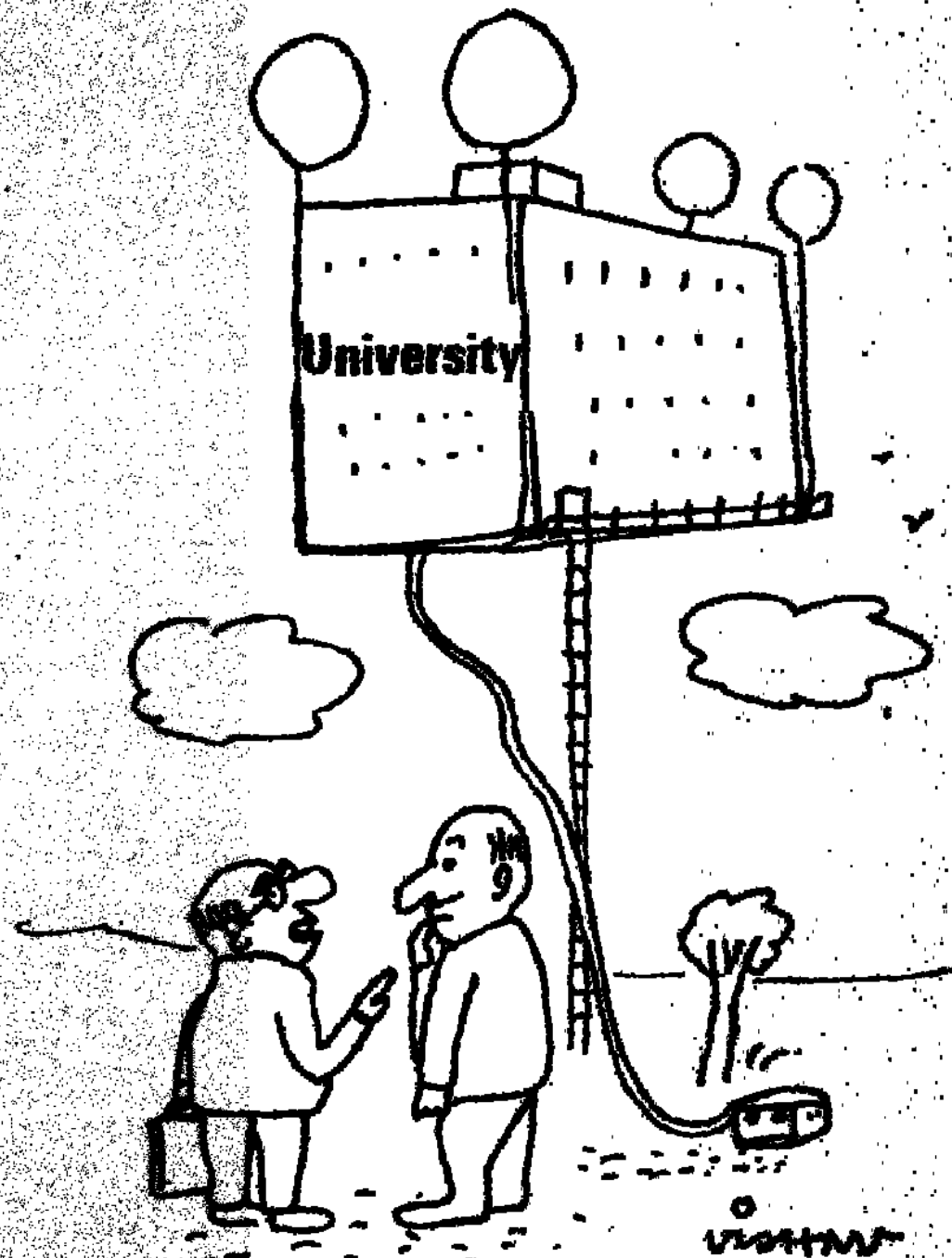
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April 1974

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**PANTNAGAR:
Home of Things
New
in Agriculture**

**Role of Hill
University**



"Is this the University of the air....."

Association of Indian Universities Publication

BERHAMPUR UNIVERSITY BHANJA BIHAR, BERHAMPUR-7 (ORISSA)

No. 2047/Admn/GE-I-53/73/BU Dated the 15th March, 1974.

ADVERTISEMENT

APPLICATIONS are invited for the following teaching posts for the Post-Graduate Departments of this University.

Sl. No.	Subject	Post vacant	No. of vacancies
1.	Labour and Social Welfare	Professor	one
2.	Zoology	Reader	one
3.	Journalism	Reader	one
4.	Journalism	Lecturer	one
5.	History	Lecturer	one
6.	Physics	Lecturer	one

Scale of Pay:

- (i) Professor—Rs. 1100-50-1300-60-1600/-
- (ii) Reader—Rs. 700-50-1250/-
- (iii) Lecturer Rs. 400-40-800-50-950/- plus usual allowances as admissible by the University from time to time.

QUALIFICATION AND EXPERIENCE

1. Professor in Labour and Social Welfare:

- (i) The candidate shall be a scholar of eminence.
- (ii) Shall possess a first or second class post-graduate degree in Labour and Social Welfare, Social work. (Personnel management and labour welfare); Industrial and Labour Relations or personnel Administration.
- (iii) A Doctorate Degree in any of the above subjects shall be preferred.
- (iv) Shall have experience in guiding research.
- (v) Shall have teaching experience in an institution or an University Teaching Department for at least ten years in any of the above subjects of which at least three years shall be in post-graduate classes.

and/or

Professional work experience in Industrial concerns in a responsible position in management with acknowledged contribution in special subjects of management, Personnel Administration and Industrial Relations.

2. Reader in Zoology:

The candidate shall have:

- (i) A first or second class Master's Degree (with at least 48 % marks) in the subject.
- (ii) A Doctorate Degree or published work of equivalent standard.
- (iii) Teaching experience in a College or an University Department for at least eight years in the subject of which

two years preferably be in post-graduate classes.

(iv) Capacity to guide research shall be regarded as an additional qualification.

3. Reader in Journalism:

The candidate shall have at least a Master's Degree in Journalism and teaching and/or professional experience for at least eight years.

or

At least a second class Master's Degree with a minimum of 48 % marks and a Degree or Diploma in Journalism with teaching and/or professional experience for at least eight years.

4. Lecturer in Journalism:

The candidate shall have at least a Master's Degree in Journalism or a second class Master's Degree with a minimum of 48 % of marks with five years of Journalistic experience in a responsible capacity in a News Paper or News Agency of repute.

NOTE : The qualifications prescribed for the posts of Reader and Lecturer in Journalism may be relaxed in case of

More Classified Advt.s. on Page 18

persons who have held responsible positions in Newspapers or News Agencies of National or International repute.

5. Lecturer in History and Lecturer in Physics:

The candidate shall have a first or second class Master's Degree (with at least 48 % marks) in the subject.

Seven copies of the prescribed application forms will be supplied to the candidates from the office of the undersigned on payment of Re. 1.50 paise in person or by Bank draft drawn on the State Bank of India, or by money order in favour of the Registrar, Berhampur University along with a self addressed envelope measuring 22x10 cms affixed with postage stamps worth 0.80 paise.

The applications duly filled in along with attested true copies of certificates, testimonials and publications etc. should reach the undersigned on or before 15th April, 1974. Applications received after the due date will not be entertained.

Candidates who are in service should apply through proper channel.

Persons in Government service selected for appointment shall be allowed leave salary and pension contribution for one year only if they wish to retain their lien under Government.

The prescribed period of experience for the posts will be calculated upto the last date fixed for the receipt of the application.

Sd/- R.C. Rajguru,
REGISTRAR.

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

NOTIFICATION NO. 31

APPLICATIONS in the prescribed forms are invited on or before 15th April, 1974 for the following posts. Prescribed application forms will be available from the undersigned on pre-payment of Rs. 8-50 by means of Crossed Postal Order.

Department of Continuing/Adult Education

1. Professor and/or Reader

(NOTE: The applicant should clearly mention the exact cadre for which his application is to be considered viz. Professor or Reader)

Scales: Professor: Rs. 1100-50-1300-60-1600 Reader: Rs. 700-50-1250.—Plus D.A., H.R.A., P.F. and Gratuity benefit as per rules.

Qualifications: (i) A first or second class Master's degree of a Statutory University in Continuing/Adult Education or an equivalent qualification of a foreign University in the subject OR A second class Master's degree in Social Sciences, Behavioural Sciences, Natural Sciences, or Humanities of a Statutory University or an equivalent qualification of a foreign University in the subject with a research degree of a Doctorate Standard or published work in Continuing/Adult Education. (ii) Teaching or research experience in a University or College or a related institution of repute — Seven years for Professor and Five years for Reader. (iii) Candidates with experience in curriculum development educational planning, evaluation and administration in the field of Continuing/Extension/Adult Education will be preferred. Responsibilities include teaching, research, programme development/Co-ordination and for Professor, it also includes responsibilities of Headship.

Applicants when called for interview will have to come at their own expense.

GENERAL INSTRUCTIONS

1. The posts carry D.A., H.R.A., P.F. and Gratuity benefit as per University Rules.

2. Candidates already in employment elsewhere should send five sets of applications in the prescribed form in advance for the post along with attested copies of all the Certificates of all examinations and testimonials and also reprints if any of their research papers and one copy should be routed through their employer.

3. Incomplete applications, or those received late or on plain papers will not be considered.

K.A. Amin
UNIVERSITY REGISTRAR.

UNIVERSITY NEWS

Vol. XII
No. 4



April
1974

*A Monthly Chronicle
of Higher Education*

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*Opinions expressed in the articles
and reviews are individual and do
not necessarily reflect the policies
of the Association.*

Editor : ANJNI KUMAR

Economics of Varsity Education

The Programme Advisory Committee set up by the Association of Indian Universities to guide the projects in the economics of higher education of the Research Cell met on March 21, 1974 under the Chairmanship of Dr. Amrik Singh to consider the memorandum outlining the Research Projects to be taken up during 1974-75 and onwards. The meeting was attended by Shri R. K. Chhabra, Secretary, UGC; Prof. A.L. Nagar, Head of the Department of Economics and Member Secretary of the Planning Committee of the Delhi University; Prof. D.D. Narula, Director, ICSSR; Dr. J.L. Azad, Director (Education), Planning Commission; Shri Anjni Kumar, Secretary, Association of Indian Universities and Dr. H. N. Pandit, Project Officer (Economics of Education), Association of Indian Universities. The Committee recommended that the Research Cell should undertake the project on comparative cost analysis of Universities of Rajasthan and Kerala and estimate institutional unit costs of education for university departments and colleges separately. The Committee also suggested that, at this stage, only recurring expenditure may be considered for estimating unit costs of education and factors responsible for variations in unit costs of education of the two universities may be investigated. It was further suggested that the universities which are similar in content, structure and organization should be taken up for the comparative analysis. The structural differences in expenditure in terms of academic, technical and auxiliary staff should also be analysed.

The Research Cell will collaborate with the Planning Unit of the University of Delhi for conducting cost analysis of the University. The Joint Research Team will analyse trends in cost and financing of the University during 1957-74, estimate unit costs of education and study socio-economic status of student beneficiaries. Attempt will also be made to study the distributional pattern of students according to those who come from Delhi and those who come from outside. Prof. D.D. Narula, Director, ICSSR and Dr. H.N. Pandit will make a suitable questionnaire for collecting the information regarding the socio-economic and educational profiles of the parents of the Delhi University students.

The ICSSR will provide the Research Cell information about the projects financed by the ICSSR in the field of financing of university education. On the basis of the success of the Delhi University Project, similar collaborative projects will be undertaken for the metropolitan city Universities of Calcutta, Bombay and Madras. Prof. A.L. Nagar, will be directing the Delhi University project.

The Committee also approved the project on Readings in Economics of Higher Education. Under this project, contributions of eminent scholars, teachers and administrators will be invited on various problems of economics of higher education. These contributions will be brought out in the form of a book. This will serve as useful help to the scholars, researchers and administrators interested in the planning of higher education.



Mr. B. Sivaraman, Vice Chairman, National Commission on Agriculture delivering the 10th Convocation Address at the G.B Pant University, Pantnagar. The Vice-Chancellor, Dr. D. P. Singh is on extreme right.

(Report on page 7)

Firsts of Pantnagar Varsity

—Pantnagar was the 1st agricultural university to be established in India (1960).

—Pantnagar is the 1st university to adopt new method of education involving fusion of teaching, research and extension.

—Pantnagar is the only university with a large seed farm covering about 11,000 acres.

—Pantnagar is the only university with an average stable net annual income of around one crore rupees.

—Pantnagar is the 1st and the only university that, has taken up production of high quality seeds.

—Pantnagar is the first university to take up comprehensive programme for research and development in new crops like soybean, sugar-beet, sunflower and sweet sorghum.

—Pantnagar is the 1st university to establish a full-fledged food science division to develop various soy-based products.

—Pantnagar is the 1st university to start a large development project called "Tarai Deve-

lopment Corporation".

—Pantnagar is the 1st university to impart instructions in Hindi medium.

—Pantnagar is the 1st university to take up translation and production of technical textbooks in Hindi.

—Pantnagar is the first university to bring out two popular monthly farm journals entitled **INDIAN FARMERS' DIGEST** in English and **KISAN BHARTI** in Hindi.

—Pantnagar is the 1st university to start placement service for its graduates.

—Pantnagar is the 1st and the only university to start a comprehensive self-employment project.

—Pantnagar is the only university to launch the massive 'Milk for Millions Project'.

—Pantnagar is the first university to develop disease resistant varieties of pulses, notably **URD**.

Around A Campus — I

G.B. Pant University of Agriculture & Technology

Home of Things New in Agriculture

PANTNAGAR is too small a campus town. It may not perhaps be even discernible on the geographical map of India. However, on the economic map of India, it has come to occupy a very pre-eminent position. Established in 1960 in a desolate expanse, The G.B. Pant University of Agriculture and Technology has come to be a humming campus from an open sky. It was the first varsity to try fusion of teaching, research and extension. In fact, the very future of this novel system of education would have been very much in doubt but for the success of the very first experiment at Pantnagar. Encouraged by the spectacular success of the Pantnagar pattern, the farm varsities or agricultural campuses have now been established in almost all the States.

One of the major advantages of this system is its over-whelming emphasis on problem-solving research. The emphasis invariably is on inter-disciplinary approach involving active participation of the staff members of the disciplines concerned. The results consequently have been quick and adequate. It has been largely because of this research effort that the 11,000-acre University Farm has been making handsome profits year after year.

Wheat

The contribution of this University in the breakthrough in wheat production has been no less significant. It has released a wide array of varieties to suit varying requirements and agro-climatic conditions. Of these, UP-301, UP-310, UP-319 and UP-215 are notable. These have been well received by the farmers all over the country.

N. K. ANANT RAO

Maize

In the matter of maize research, the University enjoys a coveted place. It is the main centre of the All India Co-ordinated Maize Improvement Scheme for the North-Eastern Plains. Of the various hybrids and composites developed at this University, the protein-rich composite called "Protina" has been found to be the most promising. Besides, a number of dwarf hybrids developed by the University are now under final assessment. Unlike other maize varieties, these dwarf hybrids withstand high velocity winds and lashing rain admirably.

Four New 'S' Crops

The University is engaged in a massive programme for development of Soybean, Sugarbeet, Sunflower and Sweet Sorghum, collectively known as 'S' crops. These new crops are expected to be of great value in tiding over the difficult position in fat, feed, sugar and protein.

Soybean

The University has made great strides in research and extension of this new protein-rich crop. Of the various varieties tested at Pantnagar Bragg, Lee, Hardee, Semmes, Clark-63, Hood and Pickett have been found to be quite promising. Besides, a number of vegetable types too have been selected. The most important being: Kim, Verde, Disoy and Bansai, etc.

Recognising the potential of soybean as a rich source of protein, the University has established a Food Science Division at a cost of Rs. 40 lakhs. The Division has already started experimental production of a variety of soy-products, e.g., soy breakfast foods, soy dal, soy flour and soy milk, etc.

Sugarbeet

Though sugar is a major industry but still it continues to be in a very unhappy condition. Of the various factors involved, the most important being the poor per hectare cane yield, low sucrose recovery, long duration of the crop and limited crushing season. The research at Pantnagar suggests that answer to all these problems lies in sugarbeet. With potential to yield almost one-and-a-half times as much sugar in five months as sugarcane in one year, sugarbeet is well poised to play an important role in years to come.

Sunflower

Sunflower is still another crop which has been engaging the attention of the University since some

time past. Pantnagar scientists feel that with as high oil content as 50 per cent sunflower is one crop that can stem the fast deepening oil crisis.

Sweet Sorghum

The University has been of the view that no livestock improvement programme can be a success unless fodder resources of the country are developed adequately. Studies at Pantnagar have conclusively established the suitability of sweet sorghum for fodder

Self-employment Scheme

The G.B. Pant University of Agriculture and Technology, Pantnagar, has extended the scope of its novel Self-Employment Scheme for farm graduates with the financial support of nationalised banks. Under the scheme the agriculture and agricultural engineering graduates do self-cultivation and custom work on hire basis with tractors and improved implements and sell agro-inputs to farmers.

They also extend requisite technical advice to neighbouring farmers. The Pantnagar University is already running this project in two Districts of Nainital and Etawah. Each graduate has been earning a net monthly income between Rs. 800 and Rs. 1000.

The Pantnagar University has now started a free one-month training course in "Tractor Operation and Maintenance" for all such agriculture and agricultural engineering graduates who intend to join the Self-Employment Scheme in Rohilkhand, Meerut Kumaon and Garhwal division of U.P. State.

purposes. Varieties Rio and IS 607 of sweet sorghum have been found to be ideal for this purpose.

Milk for Millions

The livestock improvement too has been receiving due attention of the University. The University has launched an ambitious project called "Milk for Millions". Under this project, the Livestock Research Station of the University envisages to take up

development of pure and cross-bred stocks by importing bulls and cows of such high yielding breeds as Jersey and Holstein. It may be of interest to state here that the cross-bred animals developed at the Livestock Research Station of the University have already become quite popular. During the last Farmers' Fair one cross-bred Jersey-Sahiwal cow fetched as high as Rs. 7,000.

Technical Breakthrough

Pantnagar has also been equally active in developing a wide array of handy and inexpensive implements. Of these, particular mention may be made of potato digger, soybean thresher, bajra seed drill, lifting patela and mango stone decorticator, etc.

It has also taken a big step forward not only in mechanising its own farm but also the farms in the neighbourhood. The University in collaboration with its sister organisation Tarai Development Corporation has drawn up an ambitious programme for

mechanisation of the entire Tarai area. The Corporation has already helped a number of its farmer shareholders in securing tractors, combines and other farm equipment. Tarai, in fact, has come to be one of the most agriculturally advanced areas in the country. The Tarai Development Corporation which has come to be the premier quality seed producing organisation, has plans to produce seeds enough to meet about 30 per cent of the total demand for seed of high-yielding varieties of the country. Though established only about four years back, the Corporation has already supplied quality seed of high yielding varieties of all the important crops—wheat, maize, paddy, potato, soybean, sunflower, millets, jute and pulses, etc.—to almost all the states. Small quantities of seed have even been exported—mostly to Nepal and Bangla Desh.

Pantnagar has, thus, come to be the hub of research and development activities. It has come to be the home of things new in agriculture.

Need to Change Education Pattern Stressed

The out-dated tradition of considering University degree as a passport for secure Government employment has no relevance under the present conditions. The time has come when young graduates should try to stand on their feet and launch their own enterprises. Mr. B. Sivaraman, Vice-Chairman, National Commission on Agriculture, who was delivering the tenth Convocation address of the Agricultural University, Pantnagar, said that the farm graduates in particular can play a key role in the transformation of agriculture and national economy as such by branching out in various small and medium agro-enterprises. However, for this the agricultural universities have to

so fashion their training programme that their graduates have sufficient practical background so very necessary in the competitive private enterprise.

Besides, back home such graduates could act as ambassadors of new agriculture. In this respect, Mr. Sivaraman commended the training programmes of Pantnagar University whereunder each student of the University has to do practical field work all through his stay at Pantnagar. This training has stood the Pantnagar graduates in good stead and as such they are in great demand. He revealed that the National Commission on Agriculture has urged other farm

universities to follow the Pantnagar pattern.

Earlier Dr. D.P. Singh, Vice-Chancellor of the University in his welcome address revealed that a new dimension of operational research has been added to the research programme of the University with the initiation of a unique area development project envisaging all the essential ingredients of integrated development, namely, planning, research and action. Besides, the University has launched still another ambitious programme of establishing a campus in the hill areas. The main centre of the campus would be at Ranichauri in Tehri district with a network of supporting sub-centre.

Problems of Higher Education

Role of the Hill University

S. M. DUBEY

THE HILL University in the North-East India has now been established. The University will satisfy the educational aspirations of the people of this region. It is expected, that being a Central University, it will be free from the financial hardships, and, will prove to be a real centre of learning, research and other intellectual activities. On the one hand this University will break the psychological and intellectual isolation and seclusion of the new generation of the hill people and, on the other it will unfold those aspects of tribal social structure, normative patterns, history, economy, culture, natural resources and potentialities which are not fully known due to lack of trained personnel and research.

The Hill University was conceived with a definite goal. For the first time, on August 9, 1963, the tribal leaders at a meeting at Shillong favoured the idea of a separate University for the hill people which will provide higher education to the youths and will protect and enrich the tribal way of life, social structure and culture through teaching and research. The idea immediately attracted the attention of Pandit Jawaharlal Nehru who referred the matter to the University Grants Commission, which appointed a Committee headed by Professor A.R. Wadia a noted sociologist. The committee submitted its report in 1964, which favoured the establishment of a federal type of University with constituent colleges and full-fledged centres of Postgraduate teaching and research with its headquarters at Shillong. Since the time of the submission of the report, much change has taken place in the political and administrative structure of the North East India.

The author is Professor and Head of the Department of Sociology and the 'Centre for the Sociological Study of the Frontier Region' Dibrugarh University.

While formulating the higher educational planning in the administrative units within the jurisdiction of this University, the problem of educational imbalance in the field of education, aspirations of the people, and needs of and job opportunities within this area should be properly considered.

The University will meet the academic requirements of a sensitive area which has gradually started moving on the path of planning and development. There are certain initial advantages associated with this University. Since the beginning of the British administration, Shillong has developed as a centre of this region and its colleges and institutions have been the effective base and nucleus for the growth of higher education and learning. Meghalaya, Nagaland, Arunachal and Mizoram are young political units where political elites are receptive and committed to the development. For the time being, there are twentyone undergraduate colleges in the jurisdiction of this University, with an approximate student population of 10,000. Keeping in view the number of colleges and the size of student population; better, effective and meaningful academic planning is possible. Till now, in these areas the problem of educated unemployed youths has not taken a disproportionate shape and therefore an effective manpower planning is also possible.

Recently a seminar group at Kohima discussed the 'Problems and Prospects of Planning and Development in Nagaland'. This group has made some pragmatic recommendations on the need of educational development and manpower planning in Nagaland. The people have high expectations from the development of Hill University. The major recommendations are:

- (i) the social and educational aspirations of the people should be satisfied;
- (ii) the courses, and the regulations for admission should be framed after considering the need, the job prospects and the future projections of the manpower requirements of the hill region;
- (iii) there should be a harmonious balance between the needs and requirements of the different States, the north-east region and the nation;
- (iv) as far as possible, the attempt should be made, so that, this University should not be a replica or duplication of the existing Universities.

Organisational Structure

The jurisdiction of the University covers Nagaland, Meghalaya, Mizoram and Arunachal Pradesh. The University is located at Shillong and will have a campus at Kohima also. The geographical and ecological situations of this area are such, that it is quite difficult to travel and reach from one place to another. Keeping in view this point, as well as the educational

aspirations of the people, it would be better to have a perspective academic planning for Mizoram and Arunachal Pradesh also. It would be desirable to develop post-graduate centres with provisions for research at Aizal as well as at the proposed capital of Arunachal Pradesh—Itanagar.

Till now, the growth of colleges in these political units is manageable. The economy of these states and union territories is not yet developed and in the years to come will not be able to absorb a large number of highly specialised and technically skilled manpower. It is, therefore, very much essential that serious thought should be given to the manpower requirements of this region, expansion of economy in the years to come and the types of courses to be developed and the regulations for admissions to be framed. If attempt is not made in this direction, the University will ultimately create the problem of educated unemployment in an area which has already experienced tensions.

Keeping in view the small size of the population in these States, probability is there that the required number of qualified students for the different departments may not be available.

—It is, therefore, essential that seats may be reserved for other areas on a reciprocal basis. For example, the medical and engineering colleges of Assam may reserve seats for the Hill students and in the same way, the Hill University may also reserve seats for the students of Assam, Manipur, Tripura and other states, in those fields for the teaching of which, there is no provision in these States.

—Apart from the regular teaching for the different degrees, some departments may prove their social relevance in a better way by offering proficiency courses and orientation courses for the administrative officials posted in this region or serving in the industrial organisations.

—If possible, there should be a separate wing of the University for correspondence courses and teaching through other mass media. Through this wing, the People of the entire North-East India should be provided opportunity to obtain higher education and they should be allowed to appear as private candidates at the different examinations in some selected subjects. Hundreds of people serving in the different departments are interested in higher education but due to the existing rules and regulations of the different universities are not getting opportunity to satisfy their aspirations.

Socio-Economic Needs and Education

The socio-economic life of the hill peoples centres round agriculture and forest. There are prospects for the growth of horticulture. With the achievement of the statehood, there are sufficient potentialities for white-collar jobs. With the growing industrialization, which is expected to remain agriculture and forest based, new job opportunities are bound to emerge.

Apart from the plan for higher scientific technological and liberal education, there should be sufficient scope and provisions for job and need oriented training, diploma and degree courses which may satisfy the requirements of the different political units within the jurisdiction of this University.

Organization of Courses

The courses, departments/schools should be organized in such a way so that—

(i) There should remain a proper balance between teaching and research and gradually there should be more and more emphasis on research which may be socially relevant;

(ii) There should be social relevance of the courses, so that, they could meet the requirements of the different political units of this region and the nation. The following tentative plan for the opening of the departments in the hill university is suggested. The schools (Departments) will primarily be interdisciplinary in nature.

1. School of Vocational Sciences with Special Emphasis on the—(a) Office management and the secretarial practice; (b) Accountancy/Book keeping; (c) Book production/Printing; (d) Journalism; (e) Photography; (f) Other technical courses.

2. School of Agriculture Sciences

3. School of life Sciences

4. School of Medicine

5. Centre for the Study of Sociology and the Social System of the Hill Region: One fact that should be kept in mind is that from the point of view of economic, political and educational development, the tribes of this region are far advanced and are moving on the path of progress. It is, therefore, essential, that this centre should not be entirely past oriented rather the emphasis should be on future oriented outlook. This centre should specialise in the field of the (1) Tribal Social Structure in the context of the larger Indian Social System, (2) Sociology of Economic Development, (3) Political Sociology, (4) Social Anthropology, (5) Social Demography, (6) Ecology and Tribal Social Structure, (7) Social Psychology, (8) Criminology, Penology and Correctional Services, (9) Sociology of the North East India.

6. This centre should also start one year diploma course in "Social Welfare and Personal Management"; where emphasis should be on the training of the (a) Tribal Welfare, (b) Youth Welfare, (c) Labour Welfare.

7. School for the Study of the Tribal Dialects and Comparative Linguistics: Within the jurisdiction of this University, there are more than 50 tribal languages and dialects which need careful research. This should primarily be a research oriented centre.

8. Academy for the Development of Tribal Music/Dance and Art.

9. School for the Study of Political Development and International Relations: With special emphasis on the study of the (a) Himalayan Region, (b) South East Asia and (c) South Asia.

10. School of Modern European Languages: (including English).

11. School of Indian Languages and Literature.

12. Institute of Business Management: Which will cater the growing Industrial and Commercial requirements of this region.

13. School of Education, Psychology and Teachers Training.

14. There should be Departments of History & Geography.

15. School of Pure Sciences for Physics, Chemistry, Mathematics.

16. Institute for the Study of Socio-Economic Change and Modernisation: The hill areas have been suffering from the problem of intellectual 'communication gap'. To bridge this gap, North East India needs a developed Research Institute. The purpose of the Institute will be—

- (a) To assess and understand the process of socio-economic change, modernisation and development;
- (b) To bring together the intellectuals/opinion makers/public leaders/journalists of this region as well as from other parts of India;
- (c) To have constant dialogue and discussion on the process of change, planning and development. The nature of this institute should be inter-disciplinary;
- (d) To have documentation centre which will include all available books, papers, journals, reports and records related to this area.

The problem of recruitment and selection requires a clear perspective from the very beginning, otherwise, the academic confusion will be of severe implications in a sensitive area which is politically alert and relatively advanced from the point of view of literacy. The trained and qualified manpower is not available in the hills for the time being. But the recruitment policy should be so oriented as to satisfy the aspirations of the hill people and to provide maximum safeguard to the talent available from within. This does not mean that higher education should be planned keeping in view only the local and parochial considerations. In this connection, I would like to suggest that—

- (i) Wherever talented and academically qualified local manpower is available, that must be preferred;
- (ii) In the administrative branches, as far as possible, people should be recruited only from among the political units within the jurisdiction of this University;
- (iii) There should be phase wise development of departments/schools. The senior and academically qualified persons may be selected to start the departments from any where but gradual emphasis should be to train the talented local youths and to recruit them gradually.

Punjab Agricultural University

A Varsity *With* *A Soul*

RAYMOND GRIFFITH

PUNJAB Agricultural University is truly a great University. The physical plant is, of course, undoubtedly magnificent. Even a most superficial tour of the campus will reveal this fact. Working amidst surroundings of beauty and aesthetic order surely inspires the students, the faculty and the staff.

The trimester system which allows instructors to evaluate directly their own students is superior to the system of internal and external examiners in most educational institutions here. Also, since PAU functions as an autonomous entity within the educational structure, the University appears to be able to move more rapidly to anticipate and answer current

needs in research and instruction than can colleges that are units in a longer chain of administrative command and decision.

There are many important areas in which PAU is exceptional. The leadership, for example, is inspired. That Dr. M.S. Randhawa is a definitive authority on both science and art is a tremendous asset to the University. In his controversial and stimulating book *Two Cultures*, C.P. Snow theorizes that the catastrophe of modern society results from the fact that it has been split into two cultural establishments, with men of science in one group and men of the humanities in the other, and with little effective communication between the two divisions. Many men of science lack fundamental knowledge of humanistic ideals, and many experts in the humanities lack essential understanding of modern technology. One result of this division is that educational institutions can become warped in their outlook because of one-sided leadership without balanced perspectives. This is certainly not true at PAU where, for example, the

Dr. Raymond Griffith (47), the author of this article, is a roving American educationist, who believes that the world is his home and the humanity is his fraternity. He taught English at Punjab Agricultural University, Ludhiana in an honorary capacity from March 1973 to February 1974. He was fascinated by the beautiful countryside. He wrote poems on themes viz. Kisan, Peacocks of Narangwal, PAU : The flowering trees, and many others which have won appreciation both in India and the States. He has a humanizing outlook as an educationist and has defined clearly in his articles the role which the teachers should undertake in the intellectual and emotional evolution of students.

At present, Dr. Griffith is Professor of English at Kyung Hee University, Seoul, South Korea.

new museum of traditional Punjabi culture is located right across the road from a field filled with the screen cages in which entomologists carry on research. Science and art are here side by side.

The philosophy of the professors of English at P.A.U. is that real teaching demands more than spoonfeeding passive students with facts and information read from yellowing notes. These things the students can learn on their own from books. The most important function of teaching is to teach the students desirable attitudes about this mass of facts and information. In many an institution students are filled with raw knowledge without absorbing enlightening attitudes. Thus, when they graduate, they are still but half-educated.

The emphasis on attitudes can be seen in the way PAU as a whole constantly stresses the potential and the possibilities and the excitement and the romance of Punjab. Thus Punjabi students are encouraged to gain needed skills and to put them to use in their great state. By imparting attitudes one does

not brainwash the students to think as one wants them to think. On the contrary, teaching enlightening attitudes is keeping ever in mind and expressing the real values of life and the true purposes of education.

Dedicated Attention

Many individuals in the teaching profession believe that teaching upper levels of undergraduates and teaching postgraduate students are more prestigious than instructing lower levels. Many an institution tragically allows its students in their first years to be supervised and evaluated by hacks and incompetents, and then foolishly expects the students to blossom suddenly into creative scholars in their final college years. But by then it is far too late. Attitudes and study habits have already become crystallised. The English teachers at P.A.U. do not make this mistake. They give close and dedicated attention to elementary freshman courses which are the essential foundation for all advanced university training.

The PAU works closely with the larger community. Sometimes one finds it difficult to locate friends in other departments, such as botany and horticulture and extension education, because PAU leaders do not sit isolated and passive behind thick office walls. They go out into the field and the community for work and research. P.A.U. also enthusiastically welcomes the larger community onto its campus. In September, for instance, at the Kisan Mela, hordes of farmers could be seen milling about, attending exhibits, buying seed, and feeling completely at home at the PAU, which wisely realizes that the higher purpose of education is not to educate a handful of enrolled students, but to educate all members of the larger community.

I have heard Dr S.S. Bal speak to the international students of PAU on the freedom movement in India; Dean K. Kirpal Singh talk about the great economic possibilities of increased fruit production in India; Dr Raghbir Singh discuss the great ambitions of P.A.U.'s extension education program; Dean S. Bajaj philosophize on the important goals of the college of Home Science; Dr S.S. Grewal rhapsodize about the vital role of a college of agriculture in the economy of the community. These are a few individuals chance has led me to meet and hear. There are many more men and women of vision at PAU. This then is perhaps the most exceptional feature of PAU—the large number of dreamers on the faculty who work to make their dreams become reality.

An Agricultural University's achievement is primarily measured in the advances it makes in the development and introduction of plants, in the advances it inspires and implements in all branches of agriculture and animal husbandry. One can see in many parts of the world important technological institutions that have become highly effective by becoming efficient and cold-blooded machines that stress only material progress and ignore the soul of man. PAU is an institution with a soul.

Round Up

Enrolment Low for Agricultural Courses

WHILE DELIVERING the second annual Convocation of the Tamilnadu Agricultural University, Shri G. S. Pathak, Vice-President of India, regretted that the number of students enrolling in agricultural universities was quite inadequate. Of about 30 lakh students enrolling for higher education in 1969-70, it was estimated that only 1.6 per cent of the men and 0.4 per cent of the women represented enrolment in agricultural universities. This is very low in the context of the dominant position of the agriculture in the nation's economy and the growing need for personnel trained in technology and science of agriculture.

He made particular reference to the problem of training middle level technicians in different branches of agricultural science. He, however, hoped that this omission would be remedied to some extent by the establishment of agricultural science centres in various regions of the country during the fifth plan.

With regard to the agricultural colleges which were distributed all over the country and enjoyed varied advantages of climate, location and equipment, to specialise in certain defined areas of research for which they were particularly suited and had special facilities. The result of research should however be shared

by all. This would involve in an increasing measure of planning, programme and coordination of research at the national level so as to obviate duplication of efforts and expenditure on the same field of research by a number of colleges. The agricultural strategy

during the Fifth Plan period should be to make land yield more for human consumption. This calls for the progressively expanding application of technology in agriculture. He referred to the seed revolution which had not yet had its full impact on food crops like pulses and essential commercial crops like oilseeds, tobacco and jute. This is an area of research and development by agricultural scientists. He emphasised the transformation of Indian agriculture into a progressive and profitable enterprise which could be effected only by large-scale participation of farmers in the new developmental programmes. It was the farmer who had to translate the blueprint of the laboratory into practical reality in the field. The Indian peasant had demonstrated his ability to absorb new ideas and to blend new technology with the traditional practices. It would now be the objective of graduates in agriculture to transmit the new ideas emerging from education and research to the farmers.



"Your high marks suggest that you might have used some sophisticated device for copying in your exams..."

Over-Technology Crisis Outstretching Beyond Human Resources

THE WORLD crisis created by over-technology of the profit society and industrial revolution have outstretched themselves beyond human and natural resources, said Dr. Mulk Raj Anand, while addressing the convocation of the Punjab Agricultural University at Ludhiana. "The pollution of the environment", he cautioned, "threatens to make life into death". One-third of the world, he said, consumed two-thirds of the production of the world and nine-tenths of the raw materials by looting the underdeveloped world. He wanted the process of an integral world order to be started, now, "because it will make fifty years to recycle intelligently planned human settlements".

He suggested that Punjab Agricultural University start in each district a school where rural people with matriculation education or less could learn to help in agro-industries or pick up dairy and poultry farming, fruit and vegetable farming or mushroom growing. This cadre could then go back to the family farm and help to industrialise the land-economy through small scale industries which can supplement the income of the farm by 25 to 50 per cent.

He felt pained by the fact that 95 per cent of the agricultural graduates do not go back to their land. He said the new generations of farmers' sons and daughters were being lured through cinema, the cigarette, the trousers, the transistor and the coffee house to settle in cities. To take the modern young back to the soil all their demands be met in the modernized village. "They must be taught to build from the foundations in the village and go back from the

University to teach their people", he added.

The egoism of western man, he lamented, had split European consciousness. "The Schizophrenia compelled European man to use the very knowledge acquired for the glory of the human race for the destruction of millions of people." He concluded by posing the question whether the world civilization would give up the destructive potential of armaments and the greeds of the profit or



Dr. Mulk Raj Anand delivering the Convocation Address

would the toughnecks start the third world war, "which would wipe out the human race and disable it for any conceivable future even before the year 2,000".

"Produce or Perish"

—Swaminathan

Dr. M.S. Swaminathan, Director General and Secretary, Indian Council of Agriculture Research while delivering the convocation address of the University of Udaipur said that education should be linked with research and productivity. He said while in the academic and research institutions of the affluent countries, the common slogan was "Publish or perish", the only slogan that was relevant to our situation should be "Produce or perish".

Dr. Swaminathan said Rajasthan was endowed with considerable quantities of phosphate and gypsum deposits. The State also has excellent breeds of sheep and extremely arid as well as sub-humid regions. The people of the State were known for their warmth and friendship as well as hardiness and ability to treat pleasure and pain with equanimity.

He said the students and staff of this University had a great opportunity in studying critically

the biological and physical assets of the State and converting them into wealth meaningful to the people.

Referring to desert in Rajasthan, he said, afforestation had also to be the local point for reclaiming the desert. Techniques for soil and water conservation and for sand dune stabilization were fortunately available today.

He said this State had nearly 20 per cent of our sheep population, contributing 40 per cent of the national wool clip. Research on cross-breeding at the Central Sheep and Wool Research Institute, Avikanagar and at other centres in the State had shown great possibility for further improvement in the yield and quality of wool.

He said among the major irrigation projects of the country, the Rajasthan Canal Scheme was a leading one from the point of view of potential for stepping up the production of our important

commercial crops, cotton and oil-seeds. The low precipitation and low humidity in the region coupled with assured irrigation facilities were quite congenial for good cotton, cultivation and many experts had expressed the view that this area could become the "Nile Valley" of India. Ultimately the Rajasthan Canal would irrigate about 11.5 lakh hectares of cultivable area. Based on the pattern allotted to kharif and rabi crops, the immediate potential for cotton development by the end of the Fifth Plan was estimated to be about 1.60 lakh hectares.

He said it was but natural that University students were deeply affected by the events in the world around them. The precise nature of the problems faced by universities would obviously vary from country to country and within our country from region to region. In general, however, the five major crises outlined by Prof. J.A. Perkins, namely numbers, costs, relevance, priorities and scepticism were valid everywhere

A growing mis-match between education and employment has been a subject of concern to educationists.

He warned that 1974 has become the most challenging year of this century for all connected with agricultural production in our country. Underemployment and unemployment were becoming the most serious problems of our time. Unfortunately, most of the estimates of rural unemployment dealt largely with the income and recognition aspects and not the production aspect.

Outstanding work had been done by scientists of this State in both basic and applied areas of research. The state was gifted with men of vision and valour. He said he was confident that with this tradition, those who had taken their degrees at this convocation would concentrate on utilising the tremendous opportunities open for productive and satisfying work, rather than on mourning over the difficulties that confront us.

Research contracts to reduce "brain-drain"

AS A major part of its efforts to reduce the so-called "brain-drain", the International Atomic Energy Agency (IAEA) has some 500 active contracts and agreements with laboratories in developing countries under which research is being carried out on a wide variety of subjects of immediate interest to these countries. The subjects covered include every field of research which is sponsored by the IAEA.

Although the individual sums awarded to each laboratory are seldom large, the whole programme is far-reaching in that it keeps scientists in the developing countries working in their own laboratories and in contact with colleagues working on similar problems elsewhere in the world.

Two types of awards are made by the IAEA under its research

contract programme. The "Research Contract" itself, by which a fixed sum of a few thousand dollars per contract is awarded annually, and the unusual "Research Agreement", which was developed in an effort to increase the impact of the programme, and stay within the overall budget. The Agreement does not make provision for financial remuneration, but it allows the institute entering into such an agreement to take part in one of the Agency's co-ordinated programmes of research in which a number of institutes in different countries are likewise participating, and fosters there resultant interchange of information and ideas.

Each year between 400 and 500 applications are received for new research contracts and agreements. Only about one-third of

Indo-Bulgarian Agreement

AS A result of the discussion between the representatives of India and Bulgaria for scientific and technical cooperation held in New Delhi recently a protocol was signed between India and Bulgaria.

Some of the fields in which the two countries have decided to cooperate include Turbines, pumps and their installations; research and development in ore enrichment; electrolytic refining of copper; ore dressing plants and pilot plants; bacterial method of leaching of ferrous and non-ferrous metals; corrosion research; medicinal and oil bearing plants; development of small tractors for agricultural purposes; leather technology; food and wine technology.

The Institutions in the two countries which will cooperate with each other in these fields of science and technology have also been identified.

An "Indian Science & Technology Exhibition" will be organised in Sofia in May, 1975.

these can be accepted, as the total must keep within the Agency's modest budget of some \$ 1,000,000 for the support of research in all subjects.

At the present time a total of some 600 contracts and agreements are in effect, as most of them cover a period of more than one year. Of the approximately 60 countries represented in the research contract programme, more than 40 are classified as developing countries, in accordance with accepted United Nations terminology.

The contracts and agreements offer the young scientists in the developing countries the possibility of undertaking meaningful research in their own institutes under the aegis of Agency sponsorship over a number of years. Every effort is made to ensure that

the field of research is oriented towards the particular requirements of each country.

Agency sponsorship also means that the institute itself is bound to support the project because each contract is awarded on a cost-sharing basis.

Equally important is the fact that the IAEA is prepared to arrange procurement of equipment and expendable if required on behalf of the institute (up to the value of the award). This enables scientists in a number of countries to obtain equipment which import or exchange restrictions would normally make extremely difficult or time-consuming.

Just as the research contract programme has become an integral part of the IAEA's activities in support of the development of nuclear science and technology, so has the participation of the developing countries themselves become firmly established as the result of their own efforts to understand and employ the most modern techniques.

Sri Lanka's Open University

THE UNIVERSITY of Sri Lanka has named a special committee to work out the details of the proposed "Open University".

The main purpose of the Open University will be to provide workers with a chance to obtain a university education without leaving their jobs. Government surveys show that a large number of drop-outs who later enter the labour market were forced to leave school for lack of funds.

The government also hopes the Open University will solve the problem of many teachers now reluctant to serve in distant rural schools because it means an end to their own further education.

U. S. Award for Indian Scientist

MR. J. Balakrishna Rao, a leading agricultural scientist of the Central Rice Research Institute, Cuttak, has been selected for the second Hooker award for his outstanding contribution towards increasing food output.

The Rs. 2,000 award, instituted by the Indian Agricultural Research Institute, out of the legacy of \$ 5,000 left by US journalist Mr. Richard Hooker and his wife is annually given to a leading agricultural scientist in the country.

XXVI International Physiological Congress

A SEVEN-DAY International Congress of Physiological Sciences will be held at the Ashoka Hotel in New Delhi from October 20 to 26. President V.V. Giri, will be inaugurate the conference and Prof. Hargobind Khorana will address the Plenary Session.

The Scientific Programme will be built around 29 three-hour Symposia, 30 Invited Lectures and about 70 scientific sessions of Volunteer Papers. The Physiology Department of the All-India Institute of Medical Sciences will be hosting the conference this year in New Delhi. Exhibition of scientific instrumentation, books and pharmaceuticals will be arranged. Products of the leading foreign countries will also be exhibited. The latest technical equipment, apparatus and products of interest will be exhibited to the delegates.

Present Arrangement "Out Moded"

DR. S. N. Upadhyaya, former professor of the obstetrics and gynaecological department of Patna University pleaded for setting up of medical universities in each state to maintain uniformity of standards. He was presiding over the 17th All India Obstetrics and Gynaecological Congress. The present arrangements, he said, for teaching, training the various categories of health personnel was 'out moded', ineffective and in a chaotic condition. The existing setup of universities with numerous faculties and burden of multiple responsibilities was fast crumbling under pressure.

4 More Medical Colleges in U.P.

A POSTGRADUATE college of medical sciences and three more medical colleges are proposed to be set up in Uttar Pradesh during the Fifth Plan period according to the Minister of State for Health, Mr. S. P. Singh. He said that the Government was determined to equip all the primary health centres with necessary appliances and supply them with sufficient medicine.

Change in Science Education System

AN ALL INDIA Symposium on Physics Education and Research was recently organised by the Cochin University and the Kerala Physics Academy. Over a hundred delegates from different parts of the country participated. Dr. R.S. Krishnan, Vice-Chancellor of Kerala University, in his inaugural address pleaded for a change in the traditional system of scientific and technological education so that it became more flexible and in keeping with the changed conditions. While in the last few de-

cades there have been rapid changes in the fields of science and technology, yet the examinations held in most of the colleges in the country were outmoded and needed drastic changes. The laboratory attendants in colleges set everything ready for the students who appeared for the examinations. How could student then be expected to find a suitable opening for himself utilising his knowledge of physics as a career, when he is not even familiar with the setting up of the different experiments.

Jacob Commends Internal Autonomy Scheme

DR. GEORGE JACOB, Chairman, University Grants Commission pleaded for the introduction of the scheme of internal autonomy in good colleges on a selective basis recently in Bangalore. He commended the idea to the universities in the country and was happy that certain states had even taken steps to give legal shape to it while others are initiating action.

The scheme of autonomy for selected colleges would give academic freedom to the teaching staff and make them responsible for conducting examinations. The university, would, however, maintain the overall control.

The scheme would provide greater scope for faculty to evolve a curriculum suited to the local conditions and achieve specialisation. This would give the teachers

a sense of involvement and put the responsibility for maintaining academic standards.

He discounted the possibility of abuse of this freedom by the teachers as their performance would be directly assessed by the university authorities. There would always be a desire on their part to set higher standards and achieve distinctions. The scheme would also minimise the proliferation of universities thus doing away with the unwieldy nature of some of them like the Calcutta University, which was the largest the World over with 200 affiliated colleges. Had 40 to 60 good colleges under this university been made autonomous to that extent administrative burden would have been reduced and many of the problems would have been solved.

Nine Medical Colleges Derecognised

NINE PRIVATE medical colleges have been derecognised by the Medical Council of India as they were found "below standard". Dr. Thakorebhai Patel, member of the executive committee of the Medical Council said the decision to derecognise these medical colleges was taken by the Council's meeting at Delhi recently. The nine private colleges are: Davangeri Medical College, Davangeri; Kasturba Medical College, Manipal; Medical College Belgaum; Medical College, Gulbarga; St Johns Medical College, Bangalore; Medical College, Bellary (all in Karnataka); Dr. V. M. Medical College, Sholapur (Maharashtra); Rangaria Medical College, Kakinada; and Kakatiya Medical College at Warangal (both in Andhra Pradesh).

The MBBS degree of these colleges will not be recognised for purposes of employment and medical practice in India or abroad henceforth.

Borlaug Award for Pathak

DR. M.D. PATHAK, a young Indian Agricultural scientist with the International Rice Research Institute (IRRI), Manila, has been selected for this year's Borlaug Award. The award named after Norman Borlaug, a Nobel Prize Agricultural scientist, is instituted by the Coromandel Fertiliser for the year's outstanding research contribution towards India's agricultural development. Dr. Borlaug, who is on a visit to India, presented the award besides delivering a lecture on "Conquest of Hunger". Dr. Pathak, 40 years old scientist feels that in another

three to four years India might achieve a major breakthrough in rice production similar to the earlier wheat revolution but of more significance to the country since only 15 million hectares are under wheat cultivation as against 36 million hectares under rice. Dr. Pathak is known for his primary work in developing rice strains which were resistant to a number of insect species.

Centre of Indian Languages

THE ACADEMIC Council of the Jawaharlal Nehru University has approved the setting up of a Centre of Indian Languages in the School of Languages. During the Fifth Five Year Plan, programmes of study in a number of Indian languages will be started. During the academic year 1974-75 the University proposes to start programmes of study in Hindi, Urdu and Sanskrit.

UPSC Recruitment System

THE UNION Public Service Commission has set up a high level committee with Dr. D.S. Kothari as Chairman to evaluate the present system of recruitment through examinations. The committee is to recommend such changes in the scheme of examinations and in the selection methods as would give adequate emphasis to knowledge, skills and qualities appropriate to the role and functions of the services in the context of the tasks of national development.

The committee will also consider the number of chances that should be allowed; the measures necessary to implement the decision of Government about the use of all languages included in the Eighth Schedule to the Constitution, along with English as media for the I.A.A. and the Central services examinations and the arrangements to be made for review at regular intervals of the syllabi of subjects prescribed for the various examinations to take into account developments as regards courses of study conducted by educational institutions.

New Campus of Himachal Varsity

THE WORK is fast progressing in giving shape to the Himachal Pradesh University's 300-acre campus around Summer hill. The University, which has since its inception over three and a half years ago been housed in a residential building, will soon have its own campus under the Master Plan. The Master Plan provides for three different zones. The academic zone includes eight blocks for science and arts besides the library, administrative and the directorate of correspondence courses.

Mr. Warade, the architect of the University, revealed that peculiar features like topography, structural stability of slopes, geographical environments and aesthetic aspects and last but not the least cost of construction had to be borne in mind during the preparation of the Master Plan.

Dr. R.K. Singh, Vice-Chancellor of the University, said a University campus had to be conceived as an organic whole. He said each building had been placed in such a manner that the functional principles were not violated.

Shrimali's Dig at Academic Chaos

STUDENT UNREST might appear to be senseless but there was a general discontent with the existing social order, said Dr. K.L. Shrimali, Vice-Chancellor of Banaras Hindu University, while delivering the presidential address at the 48th All India Education Conference in Calcutta. The present system of education is the "surest way to a violent revolution", he observed. The remedy did not lie in restricting entry to universities which at the present stage would mean denial of opportunity to the weaker sections of the community.

He believed that the main reason responsible for the crisis in Uni-

versities was lack of sense of commitment on the part of the faculty. He called for a critical appraisal of the present teaching methods, curricula and examinations to relate these to the needs of the individual and the society. To make students develop a sense of responsibility he recommended that they must be involved in the decision making processes.

Prof. Mrityunjoy Banerjee, State Education Minister regretted that most of the recommendations of different Education Commissions had gone by default. The educational system in the country should be re-modelled. The new deal which the State Government would introduce shortly would effect certain changes.

Research Into Ageing

A UNIT for research into human ageing is to be established at the University of Hull, in Northern England. It will cost some £230,000 and will be part of the department of zoology.

Since 1969, research has been carried out into the changing biochemistry and physiology of ageing with the aim of uncovering some of the secrets of the process which leads to a loss of vigour and adaptability in later life.

The new laboratory, which will have a controlled environment, will be completed by late 1975, when a more ambitious programme of research is planned.



COURTESY: TIMES OF INDIA

No Madam, it isn't an ancient ruin—it's very modern.
It used to be a University until last week.

UNIVERSITY OF DELHI

Advt. No. Estab. IV/21/74

Applications in the prescribed form are invited for the following posts:—

S. No. Department	Designation
1. Geology	(i) Reader (One) (ii) Lecturers (Two—one temporary upto September 1974) Reader (One)
2. Hindi	(i) Readers (Three)
3. Faculty of Management Studies	(ii) Lecturer (One)
4. Evening Law Centre No. II	(i) Readers (Three) (ii) Lecturers (Two) Lecturer (One)
5. Psychology	(i) Controller of Examinations
6. Central Office	(ii) Assistant Registrar/Administrative Officer.
7. Computer Centre	(i) Machine Supervisor.

The scale of pay of the posts are:—

1. Reader : Rs. 700-50-1250.
2. Lecturer : Rs. 400-40-800-50-950.
3. Controller of Examinations : Rs. 1100-50-1300-60-1600.
4. Assistant Registrar/Administrative Officer : Rs. 400-40-800-50-950.
5. Machine Supervisor : Rs. 210-10-270-15-450-20-530.

All posts carry D.A., C.C.A., H.R.A. and retirement benefits (in case of permanent incumbents) as admissible under the rules in force from time to time.

I. Essential Qualifications :

(1) **For Readership** : Good academic record with first or high second class Master's Degree in the subject concerned with a Doctor's Degree or equivalent published work.

Independent published work (in addition to the published work mentioned above) with at least 5 years' teaching experience in Honours/Post-Graduate Classes essential.

(2) **For Lecturership** : Good academic record with a first or high second class Master's Degree or an equivalent Degree of a foreign University in the subject concerned.

(3) **For Controller of Examinations** : A Second Class Master's Degree and experience of conducting University examinations and other allied work at the Executive level for at least 10 years and having record justifying entrusting of confidential work.

(4) **For Assistant Registrar/Administrative Officer** : A Second Class Master's Degree with 10 years Office experience of which at least 5 years' should be in a supervisory capacity.

(5) **For Machine Supervisor** : (a) Matriculation or Higher Secondary. Good knowledge of English with ability to converse and write freely.

(b) At least 8 years experience in Operation of Unit Record equipment like Key-punching machines, Account

ing machines, Collator, Sorter, Verifier, Interpreter, Reproducer, etc.

(c) Knowledge of Card designing and coding.

II. Special Desirable Qualifications :

(1) **For Readership and Lecturership in Geology** : Specialization in one or more of the following subjects: Geochemistry, Geophysics, Applied Geology, Structural Geology, Geomorphology, Mineral Fuels.

(2) **For Readerships in Management Studies** : (i) *For the first post of Reader* : Master's Degree in Economics Commerce, Business Administration, Specialization in Managerial Economics, Government and Business, International Trade of Economic aspects in Business with teaching experience in Post-graduate classes in Business Economics Government and Business is essential.

(ii) *For the second post of Reader* : Master's Degree in Business Administration Operational Research. Specialization in Production planning and Control or Purchasing and Materials Management. Teaching experience in Post-Graduate classes in Production Management is essential.

Familiarity with case methods of instruction of experience in industry in regard to Production Management or some special advanced training in the field of Production Management Purchasing and Materials Management will be additional qualifications. The essential requirement of five years' teaching experience may be relaxed for a particularly suitable candidates who has to his credit teaching experience of three years in the subject M.B.A. classes with some advanced training in Production/Materials Management or with practical experience in Industrial Management.

(iii) *For the third post of Reader* : Master's Degree in any of the Social Sciences related to Personnel Management and Business Administration. Specialization in Industrial Sociology or

Industrial Psychology or Organizational Behaviour or Organizational Development with teaching experience to M.B.A. classes is essential.

Special consideration may be given to the candidates familiar with the case method of instruction, or with experience of case writing or with advanced training in Management abroad.

3. **For Lecturership in Management Studies** : (i) Specialization in General Management or Business Policy or Managerial Economics or Marketing or International Marketing or Financial Management or Production and Materials Management of Business Law. For persons specializing in Finance, candidates with C.A. may be given preference.

(ii) Familiarity with case methods of instruction and training abroad in the field of Management or practical experience either in business or in a consulting firm will be additional qualifications.

4. **For Readership and Lecturership in Evening Law Centre No. II** : Candidates with specialization in the following subjects will be preferred:

- (i) Taxation Law,
- (ii) Public Law,
- (iii) Company Law.

5. **For Controller of Examinations** : Experience in University administration and familiarity with the working of University bodies and institutions.

6. **For Machine Supervisor** : Basic knowledge about digital Computers.

The prescribed application form can be had from the Information Office of the University either personally or by sending a self-addressed envelope with postage stamps worth Re. 1.00.

Selected candidates will have to produce the Original documents relating to their age, qualifications, experience, etc. before joining the appointment.

Application accompanied by attested copies of Degree and other certificates etc. should reach the undersigned not later than **April 20, 1974**.

Note : 1. It will be open to the University to consider the names of suitable candidates who may not have applied. Relaxation of any of the qualifications may be made in exceptional cases in respect of all posts on the recommendations of the Selection Committee.

2. Convassing in any form by or on behalf of the candidate will disqualify.

3. Candidates for the posts Sr. Nos 1, 2, 3, 4 & 5 called for interview from outside Delhi will be paid contribution towards Railway Fare as per rules.

(K. N. Thapsu)
REGISTRAR

Advertisement

SHIVAJI UNIVERSITY, KOLHAPUR

Applications are invited for the following posts:—

One Professor each in Physics, Mathematics, History and Economics.

One Reader each in Zoology, Botany, Sociology, Inorganic Chemistry and Physical Chemistry.

One Lecturer each in Mathematics, Physics (Theoretical) & Organic Chemistry with the specialization in Stereochemistry.

Pay Scales

Professor: Rs. 1100-50-1300-60-1600.

Reader: Rs. 700-50-1250.

Lecturer: Rs. 400-40-800-50-950.

Qualifications and Experience

(1) **Professor:** First or Second Class Master's Degree and Doctorate Degree in the subject of a Statutory Indian or Foreign University of repute.

Teaching Post-Graduate classes for about ten years and guiding successfully some Ph.D. students. Published research work of merit will receive due consideration.

(2) **Reader:** (a) A Doctorate Degree of any recognised University Indian or Foreign with at least Second class either at Bachelor's or Master's Degree and published independent research work;

OR

(b) Published independent research work of acknowledged merit (books and papers) with at least Master's Degree in Second Class of any recognised University.

(c) Seven years experience of teaching Post-Graduate classes;

OR

(d) Independent research work of acknowledged merit on one's own initiative.

(3) **Lecturer:** (a) A First or Second Class Master's Degree;

OR

(b) A Doctorate Degree with at least Second Class Bachelor's Degree;

OR

(c) Any other equivalent degree or degrees of an Indian or Foreign University.

(d) Five Year's experience of teaching Graduate classes at the special or principal level (wherever applicable).

Note :—Cases of highly qualified persons holding Doctorate Degree and having special qualities will be considered on their own merits).

Age Limit

The upper age limit for appointment to teaching posts under the University is ordinarily 45 years but it may be relaxed in special cases.

PROBATION :

Selected candidates will be on probation for a period of two years at the first instance. If necessary the same will be extended by a year or two.

Prescribed application forms (7 copies), can be had from the University Office. Desirous candidates are requested to send Indian Postal Order of Rs. 3/- alongwith self addressed envelope of Rs. 00-75 ps.

Seven copies of applications alongwith necessary enclosures should reach the Registrar, Shivaji University, Vidyanagar, Kolhapur-416004, on or before 6th May, 1974.

Kolhapur-416004.

Usha Ithape

Date: 29th March, 1974. REGISTRAR

GURU NANAK UNIVERSITY AMRITSAR

Advertisement No. 11/74.

Applications are invited for the following posts, likely to be filled in 1974, on prescribed form obtainable from the Registrar, Guru Nanak University, Amritsar by making a written request accompanied by a self-addressed stamped envelope of 23x10 cms. so as to

WANTED

SHORT STORIES, POEMS

We need English Poems and Short Stories for our proposed Life-in-India Series **INDO-WORLD ANTHOLOGIES**.

Genuine literary works depicting true living image of India Indians (including translations, reprints) only likely to be selected.

Return postage must be enclosed with Manuscripts. Contact :

INDO-WORLD PRESS PUBLICATIONS

6-B, Mohan Mahal, 622, V.P. Road
Khar, Bombay-400052

reach this office by April 5, 1974 from persons residing in India and by April 15, 1974 from persons residing in foreign countries alongwith postal order(s) for Rs. 7/50 for posts at serial No. 1, 2 and 3, and Rs 5/- for posts at serial No. 4 drawn in favour of the Registrar, Guru Nanak University, Amritsar.

(Besides allowances admissible under the rules, higher starting salary may be given depending upon qualifications and experience).

1. Professors (Grade: Rs 1100-50-1300-60-1600). of Biology, Physics, English, Mathematics, History, Political Science and Education.

2. Readers (Grade: Rs. 700-50-1000/50-1250) in Physics, Chemistry, Biology, English, History, Mathematics, Panjabi, Psychology, Economics, Panjabi Language, Literature and Culture and Education.

3. Lecturers (Grade: Rs. 400-40-800/50-950) in Chemistry, English, Political

Science, History, Physics, Post-graduate School of Planning, Guru Nanak Studies, Laws, Panjabi Language, Literature and Culture, Education, Economics and Library Science.

4. Research Fellows: (Rs. 300 fixed). in English, Mathematics, Hindi, History and Economics.

QUALIFICATIONS

For the posts of Professors and Readers

(i) First or Second Class Master's degree of an Indian University or equivalent qualification of a foreign University in the subject concerned;

(ii) Either the degree of Ph.D. or an equivalent research degree or published research work of a high standard;

(iii) About 10 years experience of teaching M.A./M.Sc. classes and guiding research in case of Professors and about 5 years in case of Readers.

(iv) Knowledge of Panjabi and a foreign language other than English will be an additional qualification.

For the posts of Lecturers

(i) A First or Second Class Master's Degree of an Indian University or equivalent qualification of a foreign University in the subject concerned.

(ii) Either a research degree or published research work of a good standard.

(iii) Teaching/Research experience will be an additional qualification.

For the posts of Readers in Panjabi Language, Literature and Culture

Essential

(i) First or Second Class Master's Degree of an Indian University or equivalent qualification of a foreign University in subjects mentioned below:

For the First Post: Sanskrit/Prakrit/Apabhramsa/Comparative Philology with the proviso that the candidate must be thoroughly conversant with the Panjabi Language and its script;

For the Second Post: Punjabi/English Philosophy/Aesthetics with the proviso that an M.A. in one subject must have an adequate knowledge of the other two.

(ii) About five years' experience of teaching post-graduate classes and or guiding research.

(iii) Either the Degree of Ph.D. or equivalent research degree or published research work of a high order relating to any major field of Punjabi Language/Literature/Culture.

Preferable

For the First Post: Specialisation in Etymology/Lexicography/grammar. Some knowledge of dialects of the areas adjoining the present day Panjab.

For the Second Post: Some knowledge of Sanskrit/Persian. Acquaintance with the basics of editing and lexicography.

For the Posts of Lecturers (Three) in the Punjabi Language, Literature and Culture

Essential

A First or Second Class Master's Degree of an Indian University or equivalent qualification of a foreign University in subjects mentioned below:

For the first post: Ancient Indian History and Culture/History of Art/Culture Anthropology with a good knowledge of Punjabi or a Master's degree in Punjabi (at least second class) with specialisation in Art and Culture.

Preferable

Teaching experience of Degree/Post-graduate classes for at least 3 years. Preference will be given to those who know photography and have some published work with practical experience of research in the cultural field.

For the Second Post:

Essential

Master's degree in Punjabi (1st or 2nd Class) with Diploma course in Translation. The candidate must be thoroughly conversant with the art of editing, vetting, lexicography, preparing indexes and bibliographies and should have, at least 5 years practical experience of these fields..

Desirable

Some knowledge of book production and proof-reading. Those with published work will be given preference.

For the third post

Essential

Master's Degree in Punjabi (1st or 2nd class) with a rich grounding in Literary criticism. Must have some published work of a high order and experience of editing a literary journal.

Desirable

Some knowledge of book production and proof-reading. Preference will be given to those who have experience of teaching post-graduate classes.

For the posts of Lecturers in Post-graduate School of Planning

Essential

Post-graduate Degree or equivalent diploma in Town and Country Planning or Urban and Regional Planning or traffic and Transportation Planning or Housing and Community Planning or Landscape Architecture from any recognised University/Institution.

Desirable

Membership of Institute of Town Planners (India).

For the posts of Lecturers (Three) in Guru Nanak Studies

Essential

- (i) Doctorate in the Faculty of Languages.
- (ii) Master's Degree in Urdu, 1st or Ind Division.
- (iii) Experience of translating high medieval Panjabi or Hindi literature into Urdu.
- (iv) Thorough knowledge of the Sikh Scriptures.

Desirable

Proficiency in Sanskrit/Hindi or Persian.

Essential for One Post

- (i) Thorough lexical and grammatical knowledge of the text of Guru Granth Sahib and other Sikh literature.
- (ii) Experience of Study in traditional exegetic schools such as that of the late Giani Gurbachan Singh Khalsa.
- (iii) Published Research Work of High Standard.
- (iv) Experience of teaching or Katha of Guru Granth Sahib in an established institution.

Desirable

Knowledge of Urdu/Persian/Hindi/Sanskrit.

For the posts of Lecturers in Law

Essential

LL.M. from any University in India or equivalent degree.

Desirable

- (i) Practice at Bar.
- (ii) Teaching experience for 3 years and specialisation in Administrative Law and Private International Law.

For the post of Lecturer in Library Science

(i) Should have at least Second class M.A./M.Sc. Degree from a recognised University and at least Second class Master's Degree in Library Science.

For the posts of Research Fellows

- (i) First or High Second Class Master's Degree in the subject with a good academic record;
- (ii) Research experience and aptitude for research.

Specialised fields in Biology

Development Biology, Cell Biology, Ecology, Entomology, Molecular Biology, Morphology, Taxonomy (emphasis on numerical taxonomy) Genetics, Physiology, Mycology.

Specialised fields in Physics

Solid State, Theoretical Physics, Experimental Physics, Spectroscopy, Optics, Mossbauer Effect, Chemical Physics, Applied Physics.

Specialised fields in Chemistry

Quantum Chemistry, Molecular Structure including Diffraction methods, Physico-organic Chemistry, Chemical spectroscopy.

Specialisation for the post of Reader in English

- (i) Should be capable of teaching Indo-Anglian Literature or Linguistics, or Greek Literature in Translation.
- (ii) Knowledge of the use of Audio-Visual aids for teaching purposes and for the establishment of a language laboratory.

Specialisation for the post of Lecturer in English

- (i) Knowledge of the use of Audio-Visual aids for teaching purposes and for the establishment of a language laboratory.

Specialisation for the post of Professor in History

Medieval Indian or Modern Indian History.

Specialisation for the post of Reader in History

Medieval Indian, Modern Indian or Regional History.

Specialisation for the posts of Lecturers in History

Modern Indian, Medieval Indian, European or British History.

Specialisation for the post of Reader in Mathematics

Analysis, Modern Algebra, Measure Theory, Topology, Complex analysis, Functional analysis.

Specialised fields in Psychology

Educational Psychology / Industrial Psychology/Ability and Personality Structure/Learning.

Specialisation for the post of Lecturer in Political Science

Recent Political Thought

NOTE:—The persons who applied for the following posts in 1973 need not apply again:

- (i) Professors of Political Science, Physics, Mathematics and History.
- (ii) Readers in Physics, Mathematics, Psychology, English, History and Biology.
- (iii) Lecturer in Library Science.

**Bharpur Singh
REGISTRAR**

A list of select articles culled from Periodicals received in AIU Library during February-March 1974.

EDUCATIONAL PLANNING

- Armitage, Peter.** "White paper—a step into the dark". *Higher Education Review* 5(2); Spring 73: 3-25.
- Joshi, K.L.** "Education and employment in fifth plan". *University News* 12 (2); Feb 74: 22-4.
- MacARTHUR, Brian.** "British reaction sought on plan for European education policy". *Times Higher Education Supplement* (116); 4 Jan 74: 1.
- Psacharopoulos, George.** "Input-output model for the assessment of labour skill requirements". *Higher Education* 2(4); Nov '73: 461-74.
- Simmons, John.** "Report of the Faure Commission: One step forward and two steps back". *Higher Education* 2(4); Nov 73: 475-88.
- "Towards 100m students". (Editorial) *Times Higher Education Supplement* (112); 7 Dec 73: 10.

TEACHING & RESEARCH

- Datta, K.K.** "Historical research in a university". *Education Quarterly* 25(2) July 73: 26-8.
- Dickson, David.** "Common science policy comes step nearer". *Times Higher Education Supplement* (121); 8 Feb 74: 11.
- Ferriman, Annabel.** "Lecturers do not know what effect their teaching has". *Times Higher Education Supplement* (115); 28 Dec 73: 3.
- Healey, Frank.** "Harmony in the language lab". *Times Higher Education Supplement* (118); 18 Jan 74: 111.
- Khushwant Singh.** "English zindabad Vs angrezi hatao". *Illustrated Weekly of India* 95(2); 13 Jan 73: 8-11.
- Livesey, Frank.** "Further thoughts on the teaching of economics". *Universities Quarterly* 27(4); Autumn 73: 489-91.
- Mathai, Samuel.** "English for unity". *Illustrated Weekly of India* 95(2); 13 Jan 73: 12-15.
- R.G.K. Pseud.** "ABC of backwardness". *Illustrated Weekly of India* 95(2); 13 Jan 74: 20-2.
- Ramsden Paul.** "Feedback on teaching". *Times Higher Education Supplement* (123) 22 Feb 74: 12.
- "Research organisation and the postgraduate". (Editorial) *Times Higher Education Supplement* (113); 14 Dec 73: 12.
- Thody, Philip.** "Supervised prep for students". *Times Higher Education Supplement* (114); 21 Dec 73: 12.

ADULT EDUCATION

- Burn, Barbara.** "OU may soon spawn another offspring". *Times Higher Education Supplement* (112); 7 Dec 73: 8.
- "Loan scheme for lifelong learning". *Times Higher Education Supplement* (117); 11 Jan 74: 10.
- Mathur, J.C.** "Barrio development school project: A new experiment by Agricultural University, Los Bonos, Philippines". *Indian Journal of Adult Education* 34(6); June 73: 7.
- Mathur, M.V.** "Adult education and national development". *Indian Journal of Adult Education* 34(11-12); Nov-Dec 73: 6-13.
- Nelson, A.J.A.** "Role of colleges in the education of adults". *Indian Journal of Adult Education* 34(6); June 73: 8.
- Ritchie, Jean.** "Open university in Britain". *Indian Journal of Adult Education* 34(6); June 73: 3-6.
- Sharma, Prabhu Datta.** "Women's education: A curricula model for India". *Education Quarterly* 25(2); July 73: 12-15.
- Thompson-McCausland, L.P.** "Working men's college". *Indian Journal of Adult Education* 34(7); July 73: 15-16.
- Tunstall, Jeremy.** "Open university opens". *Times Higher Education Supplement* (117); 11 Jan 74: 13.

PROFESSIONAL EDUCATION

- Counter, Kenneth.** "Liberating legal studies". *Times Higher Education Supplement* (118); 18 Jan 74: 12.
- Dickson, David.** "Four qualities doctors need and how to ensure they get them". *Times Higher Education Supplement* (119); 25 Jan 74: 5.

COMPARATIVE EDUCATION & COUNTRY STUDIES

- Butts, R. Freeman.** "New futures for comparative education". *Comparative Education Review* 17(3); Oct 73: 289-94.
- "Canada: Inter-university co-operation in graduate studies". *ACU Bulletin of Current Documentation* (12); Feb 74: 5-6.
- "Changing priorities for education in India". *Education in Asia* (4); Sept 73: 13-18.
- Cormack, Margaret L.** "Is comparative education serving cultural revolution?" *Comparative Education Review* 17(3); Oct 73: 302-6.
- Court, David.** "Dilemmas of development: The village polytechnic movement as a shadow system of education in Kenya". *Comparative Education Review* 17(3); Oct 73: 331-49.
- Deurvorst, J.H.** "Post-graduate education in the Netherlands". *Higher Education and Research in the Netherlands* 17(2); 1973: 12-23.
- Datta, Kapil.** "Concept of education in GDR". *University News* 11(12); Dec 73: 10-12.
- "European experience". (Editorial) *Times Higher Education Supplement* (117); 11 Jan 74: 12.
- Greenwood, Noel.** "Getting rid of the 'schools with ashtrays' image". *Times Higher Education Supplement* (119); 25 Jan 74: 10.
- Kapur, J.N.** "Higher education and research in Australia". *University News* 12(2); Feb 74: 4-6.
- King, Edmund.** "Time for all-round stocktaking". *Times Higher Education Supplement* (118); 18 Jan 74: 9.
- Kloss, Gunther.** "(West Germany) Expanded unified system seen as way forward". *Times Higher Education Supplement* (123); 22 Feb 74: 9.
- Kloss, Gunther.** "(West Germany) Joint body plays key catalyst role". *Times Higher Education Supplement* (116); 4 Jan 74: 7.
- Miller, Terence.** "Mass higher education a false vision". *Times Higher Education Supplement* (119); 25 Jan 74: 2.
- Moorman, Paul.** "Learning society seen as key to material progress". *Times Higher Education Supplement* (117); 11 Jan 74: 10.
- Morgan, George.** "Selection aims at cutting down wastage". *Times Higher Education Supplement* (120); 1 Feb 74: 11.
- Nurul Hasan, S.** "India: Restricting enrolments in higher education". *ACU Bulletin of Current Documentation* (12); Feb 74: 20-1.
- "Postgraduates: A case for internal reform". (Editorial) *Times Higher Education Supplement* (121); 8 Feb 74: 12.
- "Reshaping and reinvigorating U.S. higher education: Carnegie priorities for action". *ACU Bulletin of Current Documentation* (12); Feb 74: 1-4.
- Ryan, Alan.** "An essentially contested concept". *Times Higher Education Supplement* (120); 1 Feb 74: 13.
- U.S. Carnegie Commission on Higher Education. "Priorities for action: Final report". *Chronicle of Higher Education* 8(3); 9 Oct 73: 7-17.
- Wolf, Alison.** "ACE: Key card in the lobbyists' pack". *Times Higher Education Supplement* (123); 22 Feb 74: 8.

PHYSICAL SCIENCES

Astronomy

1. Shankara Sastry, K. Changes in the gravitational energy of galaxies due to collisions. Osmania University.

Mathematics

1. Aranake, Ramkrishna Narayan. Some problems in boundary layer flow and heat transfer with or without magnetic field. Shivaji University.
2. Date, Tulshiram Hari. Studies in magnetohydrodynamics. Shivaji University.
3. Gupta, Prem Prakash. Some reliability models in operations research. Meerut University.
4. Gupta, Ram Swaroop. Some external problems for univalent functions and functions with positive real part. Punjabi University.
5. Gupta, Susharma Dev. On some integrals involving spheroidal wave functions. Meerut University.
6. Modi, Jatinder Kumar. Investigations in the theory of ballistics. University of Delhi.
7. Shanthakumar, M. Investigation of some M.H.D. stability problems. Bangalore University.
8. Shastri, Subramaniam D.V.S.S. Some problems in construction of balanced incomplete block designs and related combinatorial structures. Vikram University.
9. Walter, Vimala. Splines in Hilbert spaces. University of Madras.

Physics

1. Ashok Kumar. Propagation of neutron waves in crystalline moderators. University of Delhi.
2. Bansal, Surendra Kumar. Electrical transport properties and galvanomagnetic phenomena in pure Sb single crystals at low temperatures. University of Delhi.
3. Chauhan, Sat Dev. Perturbed time-differential alpha-gamma angular correlation in ^{231}Pa and ^{241}Am and nuclear spectroscopic studies in the alpha decay of ^{237}Np and ^{241}Am . University of Delhi.
4. Eswaran, Kumar. Studies on phase and coherence in quantum systems. University of Madras.
5. Gupta, Suresh Chand. The electrical, galvanomagnetic and elastic properties of p-type lead telluride. University of Delhi.
6. Gyaneshwar. X-ray diffraction study of phenomenon of polytypism in various types of organils having layer structures. Meerut University.
7. Santokh Singh. Asymptotic behaviour of the electromagnetic form factors in Bethe — Salpeter model. University of Delhi.
8. Sharma, Jai Swarup. Few nucleon reactions at intermediate energies in model of higher baryon couplings: The processes $pd \rightarrow dp$ and $pp \rightarrow d\pi^+$. University of Delhi.
9. Subbarao, Sudha. A study of electret behaviour. University of Poona.
10. Tewari, Surya Prakash. Multiphoton ionization of hydrogen atoms in an intense radiation field. University of Delhi.

Chemistry

1. Ambekar, Gangadhar Ramchandra. Studies on intermediary carbohydrate and lipid metabolism in aureofungin producing *Streptomyces cinnamonomeus* var *terricola*. University of Poona.
2. Banerjee, Sadhna. Action of succinic anhydride and of mixed anhydride on substances containing highly reactive methylene groups, such as, triacetic lactone and acetone dicarboxylic acid. Indore University.
3. Beri, Ram Mitra. Studies on plant waxes. Meerut University.
4. Bhalekar, Anil Achut. Study of kinetics and mechanism of the oxidation of aldehydes and some ketonic compounds, acetophenones by Chromium (VI). University of Udaipur.
5. Bhalekar, Avinash. Kinetics of oxidation of some alcohols and hydrocarbons by Vanadium (V). Vikram University.
6. Chakrabarti, Purshotam Bhat. Thermodynamic study of some metal complexes. Vikram University.
7. Deep Chand. Chemical and radiochemical separation of some actinides and lanthanides. Meerut University.
8. Dureja, Prem Lata. Studies on sulphur bearing organic fungicides. Meerut University.
9. Jain, Mahesh Chander. A study of anthocyanins and proanthocyanidins from some Indian plants. University of Delhi.
10. Karira, Bal Ram G. Studies on the chemical constitution of lignin from *Eucalyptus grandis*. Meerut University.
11. Kelkar, Shrinivas Laxman. Chemical investigations of Indian medicinal plants. University of Poona.
12. Khan, Mohammad Khadir-uz-Zaman. Hydrogenation of selected aromatic compounds over transition metal catalysts. Osmania University.
13. Kulkarni, Vijaykumar Sadashiv. Studies on electroluminescence. Shivaji University.
14. Kushwaha, Veena. Analytical applications of some hydroxypyridines. University of Delhi.
15. Mahesh, Rajendra Prasad. Study of biologically important organic nitrogen compounds. Meerut University.
16. Malik, Om Prakash. Studies in new psychotropic agents: Synthesis of compounds related to cannabinoids. Meerut University.
17. More, Kundalika Maruti. Synthesis of heterocyclic compounds. Shivaji University.
18. Nagar, Ramakant. Stability of metal complexes with some nuclear substituted salicylic acids. Vikram University.
19. Padhye, Subhash Balkrishna. Studies on some naturally occurring isomeric juglones. University of Poona.
20. Ramadoss, C.S. Mycotoxins: Studies on secondary metabolites of *Aspergillus candidus*. University of Madras.
21. Rawat, Bachan Singh. Studies on sulphur group solvents for hydrocarbon type separation: Liquid-liquid extraction as applied to separation of aromatic hydrocarbons. Meerut University.
22. Seetharam, B. Studies on mammalian amylases and disaccharidases. Bangalore University.
23. Sharma, Raja Ram. Physico-chemical studies on the interaction of transition metals with some new arils. Meerut University.

24. Sontakke, Shubhangi Dattatraya. Studies in nucleases (Agave rnase). University of Poona.

25. Srivastava, Rakesh Kumar. Studies in certain aspects of ion exchange properties of hydrous zirconium dioxide and tin dioxide. University of Delhi.

26. Upadhyay, Raj Kumar. Studies in some Schiff's base complexes with transition elements. Meerut University.

Earth Sciences

1. Narayana Murthy, Inkollu Sriman. Studies on alkaline rocks of Khammam District, Andhra Pradesh, India. Osmania University.

2. Ramanathan, S. Petrology and mineralogy around Manalur, South and North Arcot Districts, Madras State (Tamil Nadu). University of Madras.

Engineering & Technology

1. Purandare, Prakash Madhukar. Design of air classifier for the separation of fines. Nagpur University.

BIOLOGICAL SCIENCES

Biochemistry

1. Damodaran, C. Mycotoxins: Biochemical studies on citrinin as a mycotoxin from *Penicillium citrinum*, a common food contaminant. University of Madras.

2. Parthasarathy, V.V. Mycotoxins: Biochemical studies on some toxic metabolites of *Penicillium oxalicum* and *Penicillium piceum*. University of Madras.

3. Saxena, Shakuntla. Glycolipid metabolism in brain: Studies on the metabolism of cerebroside-3-sulphate. University of Madras.

Botany

1. Bhattacharyya, Bithika. Analysis of germination, seedling metabolism and certain aspects of developmental physiology of lettuce, *Lactuca sativa* (Linn). University of Burdwan.

2. Bisaria, Abhey Kumar. Physiology of sex expression in plants with special reference to *Cucumis melo* (L) and *Luffa acutangula* (Roxb). Meerut University.

3. Hiremath, S.C. Cytogenetical studies in elusine and its allies. Karnatak University.

(Continued on Page 24)

Classified Advt.

PUNJABI UNIVERSITY PATIALA

(Advertisement No. 4/74)

APPLICATIONS are invited for appointment to the following posts at the Punjabi University, Patiala:

I. Department of Chemistry :

Professor (Rs. 1100-50-1300-EB-60-1600)

(i) A first or second class Master's degree in Chemistry of an Indian University or an equivalent qualification of a foreign University with specialization in any of the disciplines of Chemistry;

(ii) Either a research degree of Doctorate standard or published work of a high standard;

(iii) About 10 years' experience of research or teaching postgraduate classes at a University or a college;

(iv) Candidates should have independent research publications and experience of having successfully guided candidates of Ph. D. degree.

Desirable :

- (a) Some administrative experience
- (b) Proficiency in Punjabi
- (c) Knowledge of foreign languages.

II. Department of Human Biology

Reader (Rs. 700-50-1000-EB-50-1250)

(i) A first or second class Master's degree in Human Biology/Anthropology of an Indian University or an equivalent qualification of a foreign University.

(ii) Either a research degree of a doctorate standard or published work of a high standard.

(iii) About 5 years' experience of research or teaching at a University or a college. The candidates with background of Human Genetics, would be preferred.

III. Department of Economics

Instructor (Rs. 350-25-400-/30-640-40-800)

At least a second class Master's degree in Economics or M.A./M.Sc. in Meth-

ematics or statistics with specialisation in Mathematics from an Indian University or an equivalent qualification of a foreign University with at least two years' experience of teaching Mathematics to students of Economics.

IV. Department of Philosophy

Reader (Rs. 700-50-1000-EB-50-1250)

(i) A first or second class Master's degree in Philosophy of an Indian University or an equivalent qualification of a foreign University.

(ii) Either a research degree of a doctorate standard or published work of a high standard.

(iii) About 5 years' experience of research or teaching postgraduate classes at a University or college.

(iv) Preference will be given to one who has specialization in some of the following branches (a) Logic, (b) Philosophy of Religion, (c) Contemporary Philosophy and, (d) Social and Political Philosophy.

General For All

Qualifications and experience are relaxable in the case of candidates, otherwise found suitable for the post by the Selection Committee. Higher start within the grade admissible depending upon the ability and experience of the candidates.

House rent and Dearness Allowances, Provident Fund and Medical facilities, according to University rules.

Applications complete in all respect, on the prescribed forms obtainable on request from the Deputy Registrar (Admn.) by sending a self-addressed envelope of the size of 23 x 10 cms stamped with the 20 paise postage, should reach the University by 12-4-74 at the latest. Incomplete applications not accompanied with copies of the certificates and testimonials shall not be entertained. Separate application form should be submitted for each post.

Persons already in service should apply through proper channel. Government servants who are not in a position to submit their applications through proper channel before the due date should

submit an advance copy before the due date and regular application through proper channel by 15-4-74.

Gurcharan Singh
REGISTRAR

BERHAMPUR UNIVERSITY

BHANJA BIHAR, BERHAMPUR-7
(ORISSA)

No. 2018/Admn/GE-1-25/71/BU Dated
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Qualification and experience:

The candidate should have,

(i) A first or second class Master's Degree in Arts, Science or Commerce with a minimum of 48% of marks.

(ii) Teaching experience in a College or University and/or administrative experience preferably in a College or University, for not less than 8 years.

The applications duly filled in should reach the undersigned on or before 15-4-1974. Applications received after the due date will not be entertained.

Candidates who are in service should apply through proper channel.

The prescribed experience for the post will be calculated upto the last date, fixed for receipt of applications.

Persons in Government service selected for appointment shall be allowed leave salary and pension contribution for one year only if they wish to retain their lien under Government.

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Zoology

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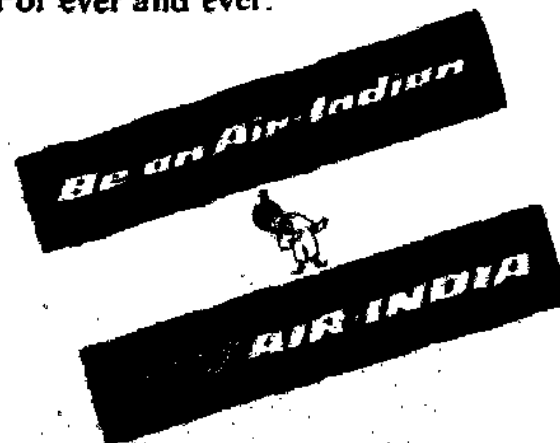
And his future was bright once again.

A year ago, there was a day that threatened to be his darkest. His retina needed immediate surgery, it needed a laser beam. And it was not available in India. A bright future hung by a slender thread.

We were contacted. The call went around 5 continents and the hunt began. Seconds ticked by, as Air-India staff combed hospitals around the world. The tension ended when the equipment was finally found in Mannheim. We flew the child to Frankfurt, another airline pooled in its effort and flew him on to Mannheim.

Today, when he chases a butterfly, picks a bunch of flowers, loves things bright and beautiful, we feel proud of our job. The job of carrying people from one place to another. Sometimes, even from darkness to light.

We have a wide network of communication facilities to help you in any situation. We have 129 offices and 34 destinations the world over. So you have friends in almost every part of the world. Friends who go out of their way if you should need something out of the way. Try us and we'll make you an Air-Indian. For ever and ever.



The Champion of University Autonomy

Sir Arcot Lakshmanaswami Mudaliar, the grand old man of medical sciences, passed away on April 15, 1974. As an educationist, he was a zealous guardian of university autonomy. He always stood up for continuing English as the medium of higher education. He was an able teacher and a distinguished medical scientist. His books have been used as standard teaching text in many countries. He was a brilliant orator, forthright critic and a man of strong principles.

Dr. Mudaliar was born on October 14, 1887. He had his college education in Madras Christian College and took his medical degree from the Madras Medical College. He became F.R.C.O.G. in 1930 and F.R.C.P. in 1966. Dr. Mudaliar served the Madras Medical College in various capacities and was the first Indian Principal of the College during 1939-42.

He made invaluable contribution in the educational field. He served the University of Madras for a record period of 27 years continuously as its Vice-Chancellor and held a number of honorary posts. He was the Chairman of the Board of Governors of the Indian Institute of Technology, Madras, from 1959 to 1968; a member of the Governing Council of the Indian Institute of Sciences, Bangalore, for 30 years (1940-70); he was a member of the Universities Commission (1948) and the Chairman of the Secondary Education Commission (1952).

Dr. Mudaliar was associated with a number of international organisations. He was a member of the Indian National Commission for UNESCO and a member of the Indian delegation to the World Health Organisation. He led the Indian delegation to these conferences on a number of occasions and was elected Chairman of the Executive Board of the W.H.O. in 1949. He was the Chairman of the Executive Board of the UNESCO for two years from 1954. He presided at the 1961 session of the World Health Assembly.

Dr. Mudaliar had been associated with the Indian Medical Council since its inception. He was the Chairman of the Academic Council of the All-India Institute of Medical Sciences, New Delhi, for a number of years. He was a member of the Bhore Committee on Medical Aid and Relief Education and was Chairman of its Sub-Committee from 1942-45.

Dr. Mudaliar was very closely associated with the development of the activities of the Inter-University Board. He was the President of the Inter-University Board during 1949 and was the Chairman of its Standing Committee from 1949-57. He had represented the Madras University at the quinquennial conferences of Indian universities since 1929. He represented India

(Continued on page 13)



CLASSIFIED ADVERTISEMENTS

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY POWAI, BOMBAY 400076

Advertisement No. 772

Admission to Postgraduate Diploma Courses in Engineering

(1974-75 Session)

APPLICATIONS are invited for admission to the following Postgraduate diploma courses (DIET), Civil Engineering Department (1) Dock and Harbour Engineering, (2) Applied Hydrology. Electrical Engineering Department (1) Computer Science.

The DIET courses are of one academic year's duration. The courses are scheduled to start on 22nd July 1974. Scholarships of Rs. 250/- p.m. are awarded to unsponsored students admitted to these courses. Hostel accommodation is available to all students.

Candidates will be selected by a test and interview at the Institute at Bombay. The candidates are to meet their own expenses for interview.

Minimum Qualifications :

Dock and Harbour Engg : At least a Second Class Bachelor's Degree in Civil Engineering.

Applied Hydrology : At least a Second Class Bachelor's degree in Engineering or a good Master's Degree in Science (Physics, Chemistry, Mathematics, Geology, Geophysics, Meteorology, Agriculture).

Computer Science : (a) At least second class B.E./B. Tech. Degree in Electrical Engineering, Electronics communications or Tele-communications from a recognised University or equivalent Degree or (b) M.Sc. in Physics (with Electronics) or (c) As a special case, B.E. or M.Sc. degree in other areas of specialization, may be admitted, provided they have sufficient background in Electronics and Mathematics.

Candidates who have appeared at the corresponding qualifying examination and are awaiting results, are also eligible to apply.

Experience in a relevant field will be considered desirable qualification. Other things being equal, candidates with experience in the relevant field and those sponsored by Government, Quasi-Govt. Educational or Industrial Organisations will be given preference.

Candidates belonging to Scheduled Caste/Tribe will be considered for Admission provided they have obtained at least 50 per cent marks at the final examination. Special consideration will be shown to them in the matter of admissions. They are exempted from payment of tuition fees.

Application forms can be had from the Deputy Registrar (Academic) by enclosing a self-addressed stamped (60 Paise) envelope of size 23 x 18 cm. and

superscribed Admission DIET course in

(Mention here Branch of course.)

Completed applications with Indian Postal Order for Rs. 5 must reach the Deputy Registrar (Academic), by 15th June, 1974.

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY POWAI, BOMBAY 400076

Advertisement No. 771

Admission to MSc. courses in Science subjects 1974-75 Session.

APPLICATIONS are invited for admission to M.Sc. course in :

- (1) Applied Geology. Duration : 3 yrs.
- (2) Chemistry. Duration : 2 years.
- (3) Mathematics. Duration : 2 years.
- (4) Physics. Duration : 2 years.

The courses are scheduled to start on 1st August 1974. Students are required to reside in the Institute Hostels.

Candidates will be required to appear for interview and a written test at the Institute at Bombay at their own expenses on an assigned date.

The Institute provides financial assistance in the form of scholarships and freeships. Scholarships of Rs. 75/- p.m. each are awarded to 25 per cent of students admitted to each course. In addition 10 per cent of the students may be awarded free tuition on grounds of need.

Minimum Qualifications :

Applied Geology : A Bachelor's Degree in Science with Geology as the Principal subject and Physics or Chemistry or Mathematics as other subject(s) with at least 55 per cent marks at the final examination.

Chemistry : A Bachelor's Degree with Chemistry (main) and Physics (subsidiary); or Physics (main) and Chemistry (subsidiary) or Chemistry, Physics and Mathematics, with at least 55 per cent marks at the final examination.

Mathematics : A Bachelor's Degree with Mathematics (Major/Main) and Physics (Minor/Subsidiary), or with Mathematics, Physics and Chemistry, with minimum 55 per cent marks at the final examination.

Physics : A B.Sc. (Hons.) Degree with Physics (main), Mathematics (subsidiary) or Mathematics (main), Physics (subsidiary) or B.Sc. with Physics, Chemistry and Mathematics with at least 55 per cent marks at the final examination.

Candidates belonging to Scheduled Caste/Tribe will be considered for Admission provided they have obtained at least 50 per cent marks at the Final Examination. Special consideration will be shown

to them in the matter of admissions and award of Scholarships and Freeships.

Notwithstanding the above, a candidate possessing Bachelor's Degree in Engineering of this Institute and wishing to seek admission to M.Sc. courses in Physics, Chemistry, or Mathematics may be considered on individual merits of the case.

Candidates who have appeared for the corresponding qualifying examination in May/June 1974 and are awaiting results are also eligible to apply.

The course in APPLIED GEOLOGY comprises course work on different subjects, work on an assigned problem and geological field work. The specialisation would largely be in the areas of Engineering geology, Mineralogy, Petrology and Economic geology.

The course in CHEMISTRY offers excellent opportunities for training in Chemistry on modern lines. This includes Quantum Chemistry, Statistical thermodynamics, Solid State Chemistry and Physics, Crystal and molecular structure, Chemical and Electrochemical Kinetics, Physical, Organic and Inorganic Chemistry, Reaction mechanism, Natural Products Chemistry, Co-ordination and Analytical Chemistry, Chemical instrumentation and Application to analytical problems.

The course in MATHEMATICS offers excellent opportunities for a broad based training in Mathematics on modern lines. The contents cover basic areas of Pure and Applied Mathematics, with Statistics and Operations Research and Numerical Analysis and Computer Programming. In the second year some scope is provided for advanced training in one of these areas. The course is designed to make it useful either for teaching and research in Mathematics or industry oriented careers.

The course in PHYSICS has been designed to give the students a good preparation in the basic subjects such as Classical and Quantum Mechanics, Electromagnetic theory and Mathematical Physics. Workshop practice and Electronics are taught to all students by engineering faculties. In second year there is scope for specialisation in certain branches of Physics.

Application forms can be had from the Deputy Registrar (Academic) by enclosing a self-addressed stamped (60 Paise stamp) envelope of size 23 x 10 cms superscribed "Admission M.Sc. course(s) in". Completed applications with Postal Order(s) of the value of Rs. 5 must reach the Deputy Registrar (Academic) by 20th June, 1974.

Postal requests for application form, received without a self-addressed, adequately stamped and duly superscribed envelope of the appropriate size, or received after 15th June 1974 will not be entertained.

UNIVERSITY NEWS

Vol. XII
No. 5



May
1974

A Monthly Chronicle of Higher Education

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Opinions expressed in the articles and reviews are individual and do not necessarily reflect the policies of the Association.

Editor : ANJNI KUMAR

Question Banking in the Universities

H. S. SINGHA

WITH deficiencies galore, it may be difficult to decide priorities in the reform of university examinations. One sector, however, stands out clearly. It concerns the betterment of questions which are really the stuff our tests are made of. As a question paper cannot be better than the worst question in it, the availability of good questions is recognized as an essential pre-requisite for examination reform. A facile way of providing for it could be to establish a collection of questions in the university. It is this universe—rather, an ever expanding universe—of questions that has come to be popularly known as a question bank. The fact that a question bank is a collection of questions appears to be common to all its prevalent concepts which differ in other details like the number of questions which constitute a question bank, their level of refinement in terms of item analysis as also in the functions assigned to the bank. This paper purports to sort out the various levels at which a question bank can be set up and how could universities go about doing it.

The idea of a question bank is neither revolutionary nor very novel.

At the school stage, the National Council of Educational Research and Training has been toying with it for some time. They have to date a pool of 11000* questions in various school subjects collected from various sources and produced in specially organized test development workshops. The question banking is also being talked about in the universities for the last few years. It got formalized as a major recommendation of the Seminar on Examination Reform organized by the Association of Indian Universities at Delhi in 1971. Later on, it appeared as a part of the action plan for examination reform prepared by the University Grants Commission.** With the setting up of a Research Cell, the Association of Indian Universities has also started exploring the idea of establishing the question bank at the national level.

Questions being the vehicle for not only testing but also for teaching and learning in most of the

*Report of the Examination Committee set up by the Central Advisory Board of Education; National Council of Educational Research and Training; 1971; Appendix 8.

**Examination Reform—A plan of action; University Grants Commission; 1973.

subjects, the availability of good quality questions would certainly have a healthy impact on the total educational process in the universities. A question bank would be an asset to teachers, textbook writers, curriculum framers and even students. But its prime function remains the improvement of university question papers by providing technically sound questions of known worth to the paper setters. Besides the improvement of teaching and testing, there are many incidental advantages of setting up a question bank in a university and they are no less important. For instance, the production of questions in the question bank would clarify and concretize the instructional objectives in different subjects, thereby helping everybody concerned with university education. If properly planned, it may involve participation by university teachers and even students, and in the present situation it appears to be a step—although a small step—in the right direction. At a time when there is a proliferation of colleges, a question bank can also help, to some extent, in the maintenance of educational standards. Since each question in a question bank carries with it statistical information, teachers in the colleges can compare the performance of their own students with the expected performance in the university. A question bank at the national level can similarly help in the maintenance of standards in the country as a whole by providing inter-university comparisons.

But whatever a question bank ultimately achieves will much depend upon the way it is organized and the level at which it is set up. There are clearly four levels at which question banking can be taken up by the universities. Because of the lack of better names, we shall call them Levels Zero, One, Two and Three.

LEVEL ZERO

At this level, a question bank is just a library of questions. The questions do not carry with them the item analysis data like the facility index and the discrimination index which help in predicting the way they would function in a testing situation. Even the qualitative details like the units of the syllabus or the instructional objectives on which the questions are based are missing. Some may even doubt whether at this level it is a question bank at all. That is why it is being called the Zero Level of question banking. Although good in itself and possibly useful to students, teachers and textbook authors, its utility for the improvement of testing seems to be rather limited.

LEVEL ONE

At this level an attempt is made in the question bank to provide essential information about each question in it. The questions are not, however, pre-tested or item-analyzed. Only such details as can be easily arrived at through a consensus of experienced teachers and subject matter experts, like the estimated difficulty or facility level and the instructional objective on which a question is based, are given. At this level, in addition to its utility for teachers and stu-

dents, a question bank becomes a better tool for testing. With the help of information about questions, it is possible to fore-cast to some extent the performance of questions in the examination. It is an improvement over Level Zero no doubt but it does not go very far because the indices are after all estimated ones. But this is perhaps the minimum that a question bank must have if it is to be an aid for paper setting.

LEVEL TWO

At this level, the question bank becomes a sophisticated collection of pre-tested and pre-judged questions, classified by the content and the instructional objectives they test. The questions are rigorously tried out and calibrated, possibly against the university standards. As the item analysis data are empirically obtained, it is possible to predict the performance of questions in the examinations very accurately.

Readers are requested to send their comments to the Editor.

tely. Naturally therefore at this level, the question bank becomes a very efficient tool for the improvement of testing. Once the design of the question paper has been finalized, the final question paper becomes a mere matter of compilation from the question bank.

LEVEL THREE

This is only an extension of Level Two with the difference that the questions with their statistical and other details are stored in a computer facilitating their retrieval and manipulation. This really represents the acme of question banking, taking paper setting to an automatic level.

Obviously, as we go higher in the level, the complexity of question banking increases, adding thereby to the organizational difficulties as well as to the cost of setting it up. But perhaps, the dividends which the universities can reap from question bank also increase with increasing complexity. An important issue that the universities will have to decide before venturing upon a question bank is, therefore, the level at which they want to organize it. The choice lies perhaps only between Level One and Level Two. May be that a university decides to begin with Level One and then plan to transform it into Level Two. Level Three would, however, remain the ultimate goal in question banking in most of the developing countries.

A word of caution at this stage would be appropriate. The question banking could suffer from the weakness of being organized at the lowest level and still aiming at the richest dividend. The University

The author is Project Officer, Association of Indian Universities.

Grants Commission visualizes the question bank in a course to consist of 50 to 100 questions of equivalent standard suitably distributed over the entire course. It is also expected that if questions are printed on cards and selected at random then the expense on setting of question papers, printing and storage etc. as also on invigilation could be largely avoided.* Can we really over-simplify the process of paper setting like this? Obviously, we are asking, rather too much from a question bank. By making paper setting entirely dependent on the bank—and that too conceived at Level Zero—we are taking a myopic view of the whole process. In fact, this may do more harm than good. It may cripple the examination system rather than improve it. If questions are chosen from out of a set of 50 to 100, examinations would be completely invalidated. It would become almost impossible for the paper setter—with his freedom drastically cut—to get a balance in the question paper in terms of both the weightages to content and instructional objectives and the distribution of difficulty or facility level and the forms of questions. Are we not ending up in testing for the memorization of certain questions when our emphasis should really be on critical and reasoning abilities? And then who can draw the boundaries to the universe of knowledge? In this form the question bank becomes a crutch for the paper setters who are not academically strong but becomes a hinderance for the imaginative ones. A question bank should necessarily be broadly conceived, imaginatively planned and efficiently operated. We should not try to go beyond its legitimate functions. It should not become the be-all and end-all of every thing in paper setting. It should be only an aid to the paper setters to be used voluntarily. Furthermore, the establishment of a question bank in a university has some other corollaries too. The university will have to modify the procedure of paper setting. It may also have to have a small Research Cell or an Academic Wing to look after various problems of question banking.

Once the above mentioned precautions are taken, it would not be at all difficult to set up a question bank in a university. If it is planned at Level One or Two, the following could be the possible stages in its establishment:

COLLECTION OF QUESTIONS

First step in question banking is clearly the collection of questions. Questions can be collected from various sources like good textbooks, question papers from different universities and the question banks in other universities as also the central question bank.

PRODUCTION OF QUESTIONS

In addition to the collection of questions, new questions will also have to be produced for the bank. This may be done by organizing test development workshops or by inviting questions from the teachers and the students. It is through this produc-

tion of questions that teachers and students can have a feeling of participation in the management of university examinations.

SCREENING OF QUESTIONS

The questions collected and produced will have to be screened. This may be done by specially constituted Screening Committees in different subjects or even by the existing Boards of Studies. If the question bank is to be set up at Level One, the Screening Committee/Board of Studies will also have to decide the facility levels of the questions as also the instructional objectives on which they are considered to be based.

TRY-OUT OF QUESTIONS

If the question bank is planned at Level Two, the questions after passing through screening will have to undergo a rigorous try-out on a representative sample of students. This would help in improving the questions and also yield statistical indices which could be used for predicting the functioning of the questions in the examinations.

STORAGE

The questions that are finally selected and refined would need to be stored scientifically. This may be done on item cards giving all the possible information about the questions. Only if we are planning the question bank at Level Three—which, of course, is a remote possibility—will these questions need computerization.

DISSEMINATION

If the question bank is to make effective contribution to the improvement of testing, teaching and learning in the universities, it should be easily available to teachers and students. Question banking should not be a hush-hush affair. For the purposes of dissemination, the question bank in each subject may even be made available in the printed form.

REPLENISHMENT AND REVISION

Question banking in the universities should not be once-in-a-life-time activity but should, on the other hand, be an on-going process. New questions will have to be added to it and the dead wood removed from it from time to time.

Obviously, the right place for a question bank is the university examination office. Moreover, every university should have its own question bank. But there is a strong need to set up a question bank at the national level as well. This could be located in the Association of Indian Universities which has a Research Cell to look after it. Such a question bank would function as the bank of banks besides acting as a trend setter in the beginning. The central question bank would also ensure uniform standards of examining in the universities. □

*ibid, p 5.

Royal College of Physicians of London And Royal College of Surgeons of England

Sir Ratanji Dalal Research Scholarship in Tropical Medicine

For Attention of intending Applicants

APPLICATIONS are invited for a full-time or part-time scholarship for research in Tropical Medicine conducted either in Britain or overseas. Candidates must be medical practitioners registered in the Commonwealth.

The value of the Scholarship will be approximately £2,500 p.a. A grant for expenses may be paid to the institution where the research is conducted.

Appointment will be for one year in the first instance, with the possibility of renewal up to a maximum of three years in all.

Further details of the Scholarship and method of application may be obtained from the **Secretary, Royal College of Surgeons of England, 35-43 Lincoln's Inn Fields, London, WC2A 3PN** by whom applications must be received not later than **15th June, 1974**.

For Attention of Institutions intending to send nominations

The Sir Ratanji Dalal Research Scholarship was established under the will of Sir Ratanji Dinshaw Dalal, CIE, MRCP, MRCS, DPH of Bombay.

The Trust requires that appointments alternate between tropical medicine and tropical surgery; applications are now invited for an award in tropical medicine, to be taken up not later than **1st September 1974**.

The Scholarship is open to medical practitioners registered in any part of the Commonwealth, and may be held in any institution in Britain or overseas that is acceptable to the two Royal Colleges. It will be awarded for one year in the first instance but may be renewed annually up to a maximum of three years in all.

The stipend will be determined by the awarding committee but is unlikely to exceed £2,500. The award may, however, be held in conjunction with other support and need not be on a whole-time basis. A small allowance for Research expenses may be offered to the institution at which the research is con-

ducted and in appropriate cases a Scholar's existing superannuation arrangements may be continued.

Applications must be sponsored by a head of department who can offer facilities and technical assistance for a research project in tropical medicine and must include the following:—

1. Full names, age and qualifications of the candidate with the name of his or her medical registration authority and date of registration.

2. Past and present appointments of the candidate, with present salary and superannuation arrangements, if any.

3. Details of the candidate's research experience and publications, if any.

4. Names and addresses of two persons, in addition to the nominator (whose comments should accompany the application), who may be consulted about the candidate's achievements and potential.

5. A statement (500 words) on the nature and scope of the proposed research project, indicating its probable duration (maximum three year).

6. Particulars of other financial support, if any assured or applied for, that may also be available to the candidate, and of the proportion of the candidate's time to be devoted to this research.

7. A declaration, signed on behalf of the department, that all necessary facilities will be provided in the event of the application being successful, with an indication whether this is contingent upon the receipt of a grant for research expenses and of the amount, if any, that would be required.

Nominations must reach the **Secretary, Royal College of Surgeons of England, 35/43 Lincoln's Inn Fields, London WC2A 3PN** not later than **15th June, 1974**.

R.S. JOHNSON-GILBERT, MA

**Secretary,
Royal College of Surgeons of England.**

NCC And the Universities

Modified Aims

K. L. JOSHI

THE Kunzru Committee on University Officers Training Corps and the earlier University Training Corps (UOTC & UTC) were appointed by the Government of India in 1946 because even if the organization was reportedly doing useful work, their number was too small for a country of the size of

The author is former Vice-Chancellor of Indore University and a UGC Fellow at Gokhale Institute of Politics and Economics, Poona.

India and secondly the trained personnel had not shown qualities of initiative, self-confidence and self-reliance which were aims of the organization. However, the Kunzru Committee were convinced that the organization had to be strengthened and expanded as it brought about improvement in the health of the students and in their discipline.

The new National Cadet Corps which resulted from the recommendations was really a youth organization on voluntary basis and it was to include junior division and girls division. Thus the senior students of the schools were to be included after the age of 13 or 14. This was a beginning of the expansion programme of the NCC. It was never visualized then that it should be made compulsory to every college student. Such a decision was taken in 1962 during the Chinese aggression when the nation was emotionally tense and there was an all-round activity among the educationists to contribute to the defence of the country. To have trained manpower not only of engineers, medical and para-medical personnel but of all able-bodied persons for Civil Defence and military career was the objective of the expansion.

Vicissitudes

The enthusiasm, however, was short-lived partly because while students enrolled themselves compulsorily, on account of the decision of the Vice-Chancellors at the Inter-University Board meeting in Bombay, it was impossible to provide for everyone the necessary equipment, uniforms and other facilities which go with the NCC organization. Further the required officer personnel for training was not easily available. The Government of India, therefore, agreed with the later recommendation of the Inter-University Board to make NCC voluntary and the numbers for NCC soon dwindled but it left a disparaging mark on the discipline and character of the NCC. These vicissitudes made the Government of India constitute the Mahajani Committee.

After the expansion the NCC had many critics because of the difficulties faced by the organization. On the other hand, the Defence Ministry was doing its best to strengthen the NCC but the universities became a little slack in ensuring the compulsory part of the NCC. Nearly 30% to 40% of the students sought exemption from attendance on medical or other flimsy grounds. There was thus a demoralization all-round. The Education Commission thought in 1964-66 that the NCC should explore "the

possibility of organizing the training not throughout the period of 3 years as at present but in a concentrated and full time programme spread over about 60 days which could be completed by students in 1 to 3 stages according to their convenience. As alternative forms of social service come into being NCC should be made voluntary, leaving the students free to opt for it or any other form of social service provided." This recommendation was not very helpful nor actionable partly because the National Social Service organization (NSS) had many teething troubles and even now though a few successes have been recorded, the continuity of a programme in the colleges and universities has not been evolved and a good deal of discussion is going on as to how such a programme could be integrated with the regular teaching programme. Moreover, much less than 1% of the student population has opted for NSS and it is facing dramatic success or failure in different colleges and universities at the initial stage. The National Sports Organization (NSO) is also in an initial stage of development and the progress is slow because resources are scarce. The only traditional organization established for more than half a century is the NCC which now enrolls about 15 to 20% of the university student population.

New Change

With the acceptance of the concept of universal education when education has been thought to be the right of every citizen regardless of sex or vocational aspirations, there has been an emphasis on preparation for citizenship and therefore there is an attempt to fill the gap between the student "out-of-the-class" and the objectives of the college or the university.

It is difficult to consider and control the collegiate social life outside the class room when the class room itself has become unmanageable. If college-going becomes a social habit the class room was not the most important part of it. With the economic trends of to-day it is hard to provide all the facilities for more than 3 millions of students. But it cannot be said, when campuses and class rooms are subjected to critical scrutiny, that there is no social awareness and social outlook among the students and the teachers. The root cause of the student unrest is really national poverty or financial incapacity to sustain the tremendous growth with semblance of standards and lack of promise of suitable employment in the system.

In this atmosphere the NCC Committee found itself compelled to suggest remedies by which discipline as well motivation could be provided to the youth of the country.

No Platitudes

One outstanding point about the Mahajani Committee report is that in analysing the present situation and in making suggestions regarding how the organization could be made an effective vehicle for fulfilling aspirations of the youth in inculcating the ideas of discipline, leadership and cooperative working, it is not padded with generalities, platitudes and inert ideas. It is direct, sharp, factual & brief, erring on

the side of practical rather than idealistic recommendations. The earlier aims of NCC have been modified to suit the modern conditions and ideas of sportsmanship, creating a force of disciplined and trained manpower, and developing among the students officer-like qualities so that they could obtain commission in the armed forces more easily, have been included in three aims of the NCC. They have also recommended that NCC, NSS and NSO should be run separately and not mixed up though they had before them ideas about integration of various activities under a National Youth Board. But the Committee thought that financially, socially and psychologically it may not be the right time to do too many things at one time and to fail in all of them rather than doing one thing successfully. To encourage the Junior Division they recommended direct entry facility to the cadets into National Defence Academy, Khadakwasla, just as 'C' certificate holders of Senior Division get similar concession to join the officers course at Dehra Dun at present.

Field Day

An important recommendation of the Committee is that academic instruction could be compressed within 5 days of the week in place of the present 6 days and one day should be called a "Field Day" which should be utilized for imparting NCC training and even other activities outside the class room for students. The activities could not only include those of the NCC, NSS & NSO but also those that relate to studies and student's standing in society. The Chairman of the Committee and the member-Secretary had specially studied this problem in the USSR by a short visit and got the idea that such an arrangement would, in modern times, encourage initiative for organization among students, and even make NSS and NSO more successful.

Actually in most of the institutions of higher education there is too much of learning by spoon-feeding and it is often forgotten that a good teacher is one who teaches the least. If discussions, seminars and tutorials are held more often and class teaching is reduced to the minimum to provoke the students to think, the idea of a "Field Day" once a week—a day to be fixed up by the institution concerned, in consultation with the students and the teachers will be a welcome change in a system dominated by teaching and examinations.

The organizational and administrative recommendations of the committee relate to making NCC voluntary and selective; reducing the strength of the senior division from 6 lakhs to the 4 lakhs; encouraging the junior division in the schools to be strengthened at the present level of about 8 lakhs because of the great enthusiasm among its members; and increasing the girls division both in the junior and senior wings by a small margin. It is also suggested that universities and academics should be more interested in the organization of the NCC which of course should remain with the Ministry of Defence, in coordination with the State Governments and the universities, as the Ministry of Defence alone is competent to supply the necessary personnel and organizational machinery. □

IRAQ

Free and Compulsory Education

ATTAR CHAND

THE ancient Iraq was perhaps the first country in the world to see the dawn of civilisation. The quest for knowledge and the preservation of cultural heritage has been a prized tradition in Iraq since the time of the Babylonians. The archaeologists have established existence of science schools in ancient times. As a seat of learning, Iraq rose to great heights during the glorious Abbassid Period, when Baghdad's reputation as a centre of knowledge, education and culture spread far and wide.

Educational Programme

This tradition, which lay dormant during the dark ages, was revived with the turn of the century, the educational drive gained momentum after 1920. In 1920 there were only about 100 primary-level schools. Now their number runs into several thousands and new schools are being opened every year. Elementary education in Iraq is free and compulsory. It may be stated that per capita expenditure on education in the country is higher than corresponding expenditure in the developed countries like the U.S.A., Britain and France. The educational programme is conducted in six stages. Pre-primary, Primary, General, Secondary, Primary and Vocational Teacher Training and higher education at college, institute or university level. In these diverse stages, the enrolments have been quite

encouraging. The pre-primary and primary school students doubled their number during the period 1957-58 to 1964-65. At primary level there were 430,000 students on the rolls in 1957-58, while the corresponding figure for 1964-65 was 948,000. Similarly, the number of schools and teachers increased from 2,145 & 12,937 to 4,430 and 38,820 respectively.

Secondary Education

The secondary education comprises two stages. The intermediate stage which extends upto three grades, has a common curriculum for all students. At the preparatory stage, the student has to choose between the scientific and the literary courses. During the period between 1957-58 and 1971-72, the number of students went up from 70,092 to 400,000; that of teachers rose from 2,549 to 3,155 while the number of schools increased from 244 to 825. The teachers training courses have also attracted a large number of students. In 1971-72, these students numbered 9,210 including 3,215 women

University Level Education

The first college established in Iraq was the Higher Teachers Training College, which set up in 1927. This was subsequently renamed as the College of Education. The Medical College and the College of Pharmacology were established in 1939. The college of Engineering came into being in 1942. The College of Girls emerged in 1947. It was known as Queen Alia College and was then renamed as Tahrir College. These institutions, however, lacked a cohesive link. Following the July 14 Revolution of 1958, the University of Baghdad was set up to include all the existing institutes and colleges.

The emergence of Baghdad University helped to accelerate the educational activity and within a decade five more universities came into being, namely, Mosul—Basrah, Sulaimaniyah, Al-Mustansirriyah and Al-Hikma. The last named was merged into Baghdad University in 1968 in accordance with the Revolutionary Command Council's decision to Iraqinise the American run Al-Hikma University.

Education in Diverse Disciplines

These universities comprise about 54 colleges and institutes. There are also private colleges, namely the Religious College of Al-A'adham and Principles of Religion in Baghdad, Business Administration in Mosul, Commerce in Basrah and Jurisprudence in Najaf. The standards varied because of differences in systems and curricula as also from duplication in syllabi. In order to remove the anomalies, the University Law No. 51 provides for a University structure for colleges and institutes with a view to utilizing the funds and facilities in proper manner with the following objectives:

1. Promoting and spreading out University education.
2. Enhancing national heritage and formulating guided educational philosophy.
3. Enhancing scientific research both in the theoretical and applies sphere under a sound university frame-work.

The university was re-organized into two distinct specified areas of activities, namely, the Colleges and scientific departments respectively.

It was with the promulgation of this Law, that education spread beyond Baghdad and new universities came to be established outside the capital.

The University of Baghdad imparts education in diverse disciplines through its constituent colleges of Medicine, Pharmacy, Veterinary, Dental Surgery, Engineering, Agriculture, Commerce, law, Literature and Education. The number of students had risen from 5,741 in 1957-58 to more than 50,000 in 1971-72. The university authorities and instructors lay stress on the balanced development of physical and intellectual faculties of students.

Parent-Teacher Associations

The parent-teacher contact is an integral part of the educational system in Iraq. The parent-teacher associations have been formed at a various levels in order to establish closer relationship between the family, the school and the community. These associations help in solving the problems of children. They also help in organising meetings, debates, parties and exhibitions. In vacation-time, they find useful work for the children. The Parent-teacher association did exist even in ancient Iraq, though in a different form. Their contribution to the cause of healthy education cannot be over-emphasized.

Vocational Education

In Iraq, due attention is paid to the fundamental education and the eradication of adult illiteracy. The fundamental education is primarily concerned with Hygiene and Health, Home Science, Village Handicrafts, Agricultural Extension and Recreation. A larger number of centres for vocational education to improve the living conditions of the village community have also been set up.

Though males still outnumber females in schools and colleges, the number of the latter is rising at a brisk pace. Women have also taken to the teachers training courses seriously. In 1971-72, there were 3,215 women trainees out of a total of 9,210. In lower classes, women teachers enjoy a comfortable majority.

Modernising Process

The July 13, 1968 Revolution under the leadership of President al-Bakr gave an impetus to the modernising process in the educational sphere. On coming to power, the Revolutionary Command Council passed a resolution, proposing comprehensive re-organisation of higher education in Iraq. The existing omnibus departments were rationalised and made uniform, organic units. The Ministry of Higher Education and Scientific Research has been entrusted with the programme of forging organic connection between the scientific development and academic institutes on the one hand and the overall activities of public life, on the other. The Ministry of Education has singularly distinguished itself by implementing the programme in letter and spirit true to the need of the children of Iraq. □

CENTRAL INSTITUTE OF ENGLISH & FOREIGN LANGUAGES

HYDERABAD-500007

Correspondence Course in Teaching English

Applications are invited for admission to the one-year Correspondence Course leading to a 'Certificate in Teaching English; beginning 1st June 1974. Only Teachers with an M.A., in English, teaching English in schools/universities/training colleges/professional or technical institutions/defence establishments are eligible for this course. Only a limited number will be admitted to the course. For Prospectus and Application Form write to the Convener, Correspondence Courses Unit, Central Institute of English and Foreign Languages, Hyderabad-500007, enclosing a crossed postal order for Rs. 2/- drawn in favour of the Director, CIEFL and a self-addressed stamped (35 paise) envelope of size 23×10 cm. The last date for receipt of completed application forms is **15th May. 1974.**

Registrar,

**Central Institute of English
and Foreign Languages,
HYDERABAD-7 A.P.**

Around A Campus—II

PAU is 12 Years Old

PUNJAB Agricultural University came into being in 1962 and in 1970, its Hissar Campus was made into a separate Agricultural University for Haryana and the Palampur Campus affiliated to the University of Himachal Pradesh to serve their respective states. An agricultural University is not an institution for the elite. On the other hand it is meant to serve the farming community and its research and extension activities are directed at the solution of their problems.

PAU has five constituent colleges and 33 departments and the main campus covers an area of 1200 acres of which 740 acres are research farms. Besides, it has five regional research stations and seven substations where research is concentrated on selected crops or on aspects peculiar to the area where they are located.

The University is spending 40 per cent of its budget on applied and fundamental research in agriculture and allied sciences. Over 100 co-ordinated schemes financed by the ICAR, the State Government and others agencies are in hand.

The University has so far given to the Punjab farmers over 50 new and improved varieties of various field and horticultural crops. The following paragraphs sum up the recent work of the university:

The most significant contributions of PAU has been to the wheat crop of the State. Starting with C 306 variety in 1965, a variety *par excellence* among all the indigenous improved wheats, the Breeders have so far evolved five wheat varieties—PV-18 (1967), Kalyan Sona 227 (1967), S-308 (1968), WG 357 and WG 377 (1972). Three very promising new strains—WL 334, WL 394 and WL 405 have been released by the Variety Evaluation Committee of the University for extensive testing on cultivators' fields. WL 334 and WL 394 are 3-gene dwarfs. Both have bold amber coloured grains. WL 394 and WL 405 are being tried at about 100 locations in Punjab.

Besides wheat the cultivators have been provided other better varieties of summer crops particularly of *bajra*, pulses, oilseeds and rice. The emphasis is on yield and stable performance, early maturity, resistance

to diseases and pests and better quality characteristics.

In rice, the development of two varieties—RP5-3 and HM-95—have been an important achievement. Besides, some other varieties (IR-8, Jaya, Jhona 351, and Palman 579) too had been evolved. Though Punjab is not known for rice, it contributed one-third of the nation's rice pool during 1973-74. Rice production in Punjab has doubled in five years.

Efforts are now being made to develop high-yielding dwarf *basmati* varieties so that the production of quality of rice can be improved in view of their demand for export. However, the varieties that are with the farmers have enabled them to stagger rice transplanting over a longer period, because, they have different maturity periods.

With respect to maize, the composite variety *Vijay* has proved to be the highest yielder in the country. Now, steps have been taken to make it mature early. An intensive hybridization programme for reduction of its height has also been initiated.

In pulses, *moong ML 1* and the green gram variety *Hare Chhole-1* have proved to be promising. The limiting factor in the production of pulses—*mash*, *moong* and soybean—has been the incidence of yellow mosaic virus. Steps are now being taken to evolve high-yielding and mosaic resistant varieties.

Research done on cotton cultivation has indicated that when the crop is grown in paired rows with an irrigation-furrow in between, the plant population remains same but the incidence of pests is reduced and water losses economised to the tune of 40 per cent.

The work done in oilseeds is also worth mentioning. The groundnut variety M-13 continued to be a top-yielder. The only draw back has been the lack of suitable arrangements for multiplying its seeds.

Sunflower is assuming importance in the State. The varieties EC-69874 of Sunrise Selection and EC-68413 and EC 68414 have been recommended for sowing in spring, summer and winter, respectively. Sunflower is also being tried as an inter-crop in the spring planted sugarcane.

The breeding approach in sugarcane is to evolve varieties with high content of sugar, high yield, different periods of maturity and resistance to draught, cold, diseases, insects and pests. Two promising strains COJ 64 (early) and COJ 67 (mid-season) have also been developed. The new variety COJ 64, which is expected to be released for general cultivation in the State very soon has high percentage of sucrose in its juice.

Very interesting studies have been made on inter-planting of various crops such as potato, onion, raya and wheat in autumn planted sugarcane. This practice is likely to give more returns to farmers and recovery to sugarmills.

Research is in progress to develop suitable varieties for summer and main *kharif* seasons of sorghum, cowpea and *guar*.

The breeders of the PAU have prepared a comprehensive outlines of the future prospects before the Punjab farmers in so far as they relate to new plant types. Besides, field crops, work on breeding better quality fruits and vegetables is also in progress.

Soil scientists are experimenting on increasing the efficient use of fertilizers. They have mapped saline—alkali soils of the Sangrur district to enable the Land Reclamation Corporation to undertake their amelioration.

The economists of PAU have studied the various aspects of agricultural finance and the distribution of gains of the green revolution with a view to providing factual data to the policy makers.

The Zoology department has undertaken the setting up of a fish seed farm at a cost of Rs 6,50,000, sanctioned by the Punjab Government. It will endeavour to urge the farmers to go in for fish-keeping.

A new proto-type reaper-binder for harvesting grain crops have been developed. Mounted on a 20 or 30 HP tractor it works efficiently. It may prove to be a logical step between the sickle and a combine harvester for wheat. Studies on solar energy for heating water and other purposes have also been taken up.

A new strain of white leg horn has been developed for high egg-production. A strain of meat-type chickens has also been evolved. A new compound of urea has been developed to reduce the cost of animal feeding.

During the soil testing-week held in May 1973, over 46,000 soil samples were collected and analysed. The University got planted 45,000 fruit trees on 7,000 tubewells in the State.

During 1973-74, a sum of Rs 109.08 lakh was spent on buildings under construction. The completion of the Museum of Social and Cultural History of Punjab at the Campus is a significant landmark.

The University provides guidance and direction to the State in the matters relating to agriculture and allied fields. Facilities in the various departments of PAU have thus been strengthened to meet the specific needs and requirements of various state and national organisations. □

Discontentment Among Students —Govt. Measures

THE INCREASING discontent among the student youth is engaging the attention of the Government of India and has been studied in depth by several Committees and Conferences constituted from time to time. It has been held that it is not an ailment in itself but is only a symptom of several shortcomings existing in the larger body politic which is influenced by the existing social, economic, educational and political system.

The recommendations made by these Committees and Conferences, have been communicated by the Union Government to the State Governments and the Universities for consideration and implementation. The Central Advisory Board of Education has also constituted a Committee to study the question of "Student Unrest". It is to suggest ways and means to enable the students to take full advantage of the educational opportunities and equip themselves to play their proper role in building a new nation. Prof. Nurul Hasan, Union Minister of Education is the chairman of the committee which comprise of student leaders, teachers and members of the University Grants Commission. The committee is expected to submit its recommendations by June on the basis of which some reforms would be introduced at all-India level during the coming academic session.

The National Service Scheme (NSS) which was started in Universities and colleges on a very limited scale during the Fourth Five Year Plan is now being expanded to cover a large number of students with a view to integrating this programme of education combined with service into the system of education itself. During the year 1973-74, the expenditure by the Government of India on the programme of 'Youth Against Famine', and on National Service Scheme is expected to be about Rs. 81 lakhs and about Rs. 51

lakhs respectively. A report on the evaluation of the 'Youth Against Famine' project undertaken by the Delhi School of Social Work has been submitted to the Government of India. This as well as the evaluation of the N.S.S. indicate the usefulness of the scheme and the desirability of continuing these projects.

At the 49th annual meeting of the Association of Indian Universities held at Kharagpur in February, 1974, twenty four papers on National Service Scheme were submitted and considered. There was a general consensus at the meeting that Universities should now take an early decision about ways and means of integrating N.S.S. with the curriculum. This will give a new meaning and focus to education itself. It will also enrich education and simultaneously utilise energy of young people in construction channels.

There is much scope for such work through liquidation of illiteracy, provision of welfare and developmental services, conducting of "Youth Against Famine" type campaigns, creating community assets in rural areas and promoting various programmes of employment and self-employment. Student and non-student youth are also being brought together in various constructive activities through the programmes of Nehru Yuvak Kendras.

The amount sanctioned by the Government of India for the Nehru Yuvak Kendra Scheme during 1972-73 and 1973-74 was Rs. 13,64,677.17 and Rs. 32,16,995.57 respectively. The figures of actual expenditure are not yet available. Since the Scheme has been started only recently, and will take some time to be fully implemented its evaluation is premature.

The University Grants Commission, within its limited resources available is also making earnest efforts to improve the quality and content of higher education in accordance with its statutory obligations. The UGC has also undertaken several programmes for student welfare. Steps are underway for greater participation of students in the affairs of the Universities. However, to be effective, they will have to be supplemented by appropriate measures in the economic, social, and cultural fields.

The Union Government proposes to continue the NSS including the programme of such youth camps in the Fifth Five Year Plan. It also proposes to expand the Nehru Yuvak Kendra Scheme in the country during the Fifth Plan period.

The Union Government has received representations from time to time from teachers and students associations for participation of teachers and students in the management of universities and colleges. The Gajendragadkar Committee in its report on Governance of Universities has *inter-alia* made certain recommendations with regard to teacher and student participation.

The Union Government and the UGC have accepted, in principle, the recommendations of the Committee. The report of the Committee has also been forwarded to State Governments for consideration while amending Acts of Universities.

The Aligarh Muslim University Act, as amended in 1972, provides for representation of students on the Court and of teachers on the various University bodies. The Statutes of the Jawaharlal Nehru university, which have been amended recently, include *Inter-alia* provision for representation of students on the Academic Council and Boards of Schools.

The Academic Council of Delhi University has also agreed in principle to student participation in the Academic Council and the Committees of Courses and Studies in various subjects. The details are being worked out by a Committee which is also looking into the question of student participation in other bodies of the University. This will also involve amendment of the Statutes of the University. □

The Champion of Varsity Autonomy

(Continued from Cover)

on the Council of the Association of Commonwealth Universities for a number of years. He was member of University Grants Commission and the Council of Scientific and Industrial Research.

He was elected Chairman of a Sub-Committee on Pre-natal Clinical Studies at the first World Conference on medical education held in London in 1958. In the second conference held in Chicago his address was widely praised and he was hailed as an authority on obstetrics and gynaecology who was alive to the latest developments.

Dr. Mudaliar made useful contribution as a Legislator; when he was in the Madras Legislative Council from 1946 onwards. He was Leader of the Opposition in the House during 1967-70. He was a member of the Rajamannar Committee on State Autonomy set up by the Tamilnadu Government.

The Leon Bernard Foundation of Switzerland awarded him in 1970 for his outstanding achievements in the fields of obstetrics, gynaecology, medical education, social medicine and international health. The University of Oxford conferred the honorary doctorate on him. He was awarded the Padma Bhushan in 1954 and the Padma Vibhushan in 1963. Men like Dr. Mudaliar are conspicuous by their absence today and now that he is no more one can only say, another colossus has passed away.

Delhi Athletes Sparkle In Varsities Meet

K. G. K. CHOUDARY

THE 34th All India Inter-Varsity Athletic Meet, which was recently organised by Jiwa-ji University, Gwalior, attracted the outstanding athletes from the four corners of the country. It was fascinating to see forty-four universities, displaying their resplendent flags, at the march past ceremony.

Out of 51 (men) and 23 (women) teams which were entitled to take part in the All India Inter-Varsity Meet, only 44 (men) and 20 (women) teams participated. There were 233 athletes in all—182 men and 51 women—, representing their respective alma-maters. 500 athletes from North & West Zones; 180 from East Zone and 230 from South Zone, took part in the zonal Meets which were held in Gwalior (for North & West Zones); Benaras (for East Zone) and Bangalore (for South Zone) towards the end of last December.

The salient feature of the Meet was Angel Mary (Mysore) in her true colours. With a perfect "straddle jump" she eclipsed Anita Sud's (Bangalore) record of 1.53 metres which she set up last year at the Universities meet in Ahmedabad. High jumper Mary cleared 1.54 metres in her first attempt to prove her prowess. This writer would like to reiterate that Mary had cleared 1.54 metres

in the zonal meet at Bangalore last-mid-December. Mary was the first to set up a new record after a day's monotonous events. Mary has the potential, and should she be trained properly, I am optimistic that she can go farther and farther.

International Gita Zutshi of Panjab University was another

impressive athlete in the Meet. She showed wonders by outracing the national record holder in 800M-Run, Jalaja Nathan. Both Gita Zutshi and Jalaja Nathan represented the country at the First Asian Track & Field at Manila, last November. Both are promising athletes, though the latter has put on a little weight which has marred her mobility.

In 400M too, Gita Zutshi earned the first place by easily beating her opponent, A. K. Oomana (Madras). Gita clocked 59.6 secs. Gita can beat Nani Radha's record of 58.8 secs, if she can improve to keep a uniform stepping.

Ebullient Marie Verghese (Bangalore) was another eye-catching woman athlete on the second day. Once Delhi's ace sprinter, Verghese showed incredible dash, clocking 12.5 secs. in 100-M-run, though she was unluckily 0.3 sec behind Nani Radha's record of 12.2 Sec. It



Delhi University won the men's championship with 36 points. Picture shows Delhi athletes receiving the Trophy from the Chief Guest, Brig. Bhandari. Prof. S.D. Chopde, is on right.

was heartening to see a marked improvement in Marie's sprinting ability.

The third day again belonged to the women athletes. K. M. Celine (Kerala), who was crowned 'Pentathlon Queen' (3030 points) the previous day, broke Anita Sud's record of 5.40 metres with a leap of 5.44 metres in Long Jump. It was really a fine performance. This correspondent is of the view that Celine has the potentialities of a glorious long jumper which ought to be fully exploited by her coach if she is aspiring for something higher in athletics.

One of the most interesting events of the day was the 4 x 400 metres relay. If the men's team from Kerala University completely outran Mysore team, their women's team did not lag behind. They easily beat Delhi University in a thrilling finish.

Time for men: 43.6 secs.

In 100M-Run, R. Gnanasekharan (Madurai) took a great advantage of A Chatterji (W. Bengal) who was a notable absentee. Chatterji clocked 10.6 secs in the zonal meet at Banaras last December. Gnanasekharan, who clocked 10.7 secs, equalled the record set up by S. Ghosh (Utkal) in 1961 and P. Rajasekharan (Madras) in 1962.

Vijay Bahadur Singh Gurnanak) eclipsed Bruce Heyman's (Bombay) in Shot Put with a heave of 15.10 metres. Heyman had recorded 14.93 metres.

Alifereti Cawnibuka (Jiwaji University)—a Fijian—was another athlete to impress in the Meet. He came out with flying colours in 110M Hurdles, clocking 15.2 secs. This writer would like to mention that in the Zonal Meet, Cawnibuka had clocked 15.0 secs to eclipse Nirmal Singh's (Punjab) record of 15.1 secs. Immediately after the event, this writer had a powwow with Cawnibuka as to why he could not repeat his performance which he displayed in the zonal Meet. "The wind did not favour me," the Fijian said in a disappointing tone. I consoled him by saying: Anyway you have outclassed everyone, and so I must con-

gratulate you. He was in smiles.

Delhi's volatile athlete, Harkamaljit Singh defeated his strong rival and winner of 100M race, R. Gnanasekharan in 200M-Run. Harkamaljit clocked 22.2 secs to beat Gnanasekharan morally. Both Harkamaljit Singh and Amarjit Singh, who came first in 400M, are brothers. They were the backbone of Delhi University which lifted the men's championship with 36 points.

In 10,000 metres, Darshan Singh of Gurunanak University set up a new record by clocking 31:48.2. Next to him was Punjab University's 'Iron Man' Harmit Singh. He clocked 31:50.8 secs in a close contest. Though Harmit Singh lost the battle, yet this writer is of the view that he is a better distance runner than Darshan Singh. Harmit has both uniformity and endurance of stamina and speed.

In 20 Kms walk, Francis D. Alapett (Calicut) came first, clocking 1 hr. 58:26.0 secs. A volatile walker, Alapett failed to improve upon his timing of 1 hr. 51:10.0 secs. which he set up in the zonal meet at Bangalore last

December. The walk, held for the first time in Inter-Varsity athletic meet, did not attract too many competitors. However, it was nice to see a competition in endurance and stamina which are necessary factors in athletics.

The women's championship was won by Kerala University (25 points) which established supremacy over Bangalore University. The reason for this could be attributed to Kerala University's fine performance in the relay race. Delhi won the men's championship.

The organisational part of the meet was good. It was commended unanimously by the coaches and managers of various universities. For this, the credit goes to the Jiwaji University Sports Committee Chairman, Prof. S. D. Chopde, who voluntarily thrust upon himself the responsibility of conducting the meet when other universities refused to conduct the meet due to financial stringency; and to the dynamic sports officer of Jiwaji University, J. S. Naruka, who worked round the clock in connection with the meet.



"Playing a defective tape at the Convocation has created a scandal of great magnitude because the new graduates were deprived of a speaker at whom they could hurl abuses.

BOOKS

1973 DIRECTORY OF CROSS-CULTURAL RESEARCH AND RESEARCHERS.

Pages 152. Price \$ 3.50 Individuals, \$ 5.00 Institutions and Libraries.

Available from: W. J. Lonner, Department of Psychology, Western Washington State College, Bellingham, Washington 98225, USA.

THE "1973 Directory of Cross-Cultural Research and Researchers" is an expanded and updated edition of the 1970 Directory. It has been compiled and edited by John W. Berry, Walter J. Lonner (editor, *Journal of Cross-Cultural Psychology*), and Jules Leroux (editor, *International Journal of Psychology*). Forms were distributed during 1973 and were completed and returned on a voluntary basis. Individual participants include most of the researchers throughout the world who identify with cross-cultural research in the behavioral sciences.

The 1973 Directory has the same aims as previous editions: to encourage collaborative research and communication among behavioural scientists interested in common cross-cultural problems and methods. The new edition contains information about 1,125 individuals from more than 75 countries, whereas the 1970 edition included only 600 entries.

The new Directory is completely cross-referenced by both "Culture Areas of Interest" and "Psychological Areas of Interest". Complete addresses are given for all researchers, and language familiarity is also given. Also included are the following:

Information about 30 journals which publish cross-cultural and sub-cultural material, together with subscription rates, edi-

torial addresses and subscription addresses for each.

Information about cross-cultural organizations that have an explicit cross-cultural focus.

A helpful guide to researchers who may be preparing manuscripts for submission to cross-cultural journals (especially the *Journal of Cross-Cultural Psychology*).

AWARDS FOR COMMONWEALTH UNIVERSITY STAFF 1974-76.

Published by The Association of Commonwealth Universities, 36 Gordon Square, London, England WC1 OPF.

Price £ 1.

Here is a publication of the Association of Commonwealth Universities which should prove helpful in the matter of fellowships, visiting professorships, grants, etc open to university staff in a Commonwealth country who wish to carry out research, make study visits, or teach for a while at a university in another Commonwealth country.

This is now an enlarged handbook of 140 pages and provides basic information about sources of financial aid for academic and administrative staff who wish to undertake research, make study visits, or teach for sometime in a Commonwealth country other than that in which they are currently serving. Besides, some of the other valuable information this handbook, provides information on the services offered by certain organisations (such as the Association of Commonwealth Universities and the Inter-University Council for Higher Education Overseas) on fellowships, visiting professorships and lectureships, travel grants, etc.

The "Guide" is published at two-yearly intervals and is a com-

panion volume to *Scholarships Guide for Commonwealth Postgraduate Students*. It covers all subjects of study or research in which there are university facilities.

THE MAKING OF A LIBRARY: The academic library in transition. By Robert S. Taylor.

New York, Becker & Hayes Inc. (John Wiley), 1972.

This is the 'Hampshire College working paper No. 2. The Hampshire college working paper No. 1 is titled 'The making of a college: plans for a new departure in Higher Education'.

In eight chapters of the book the author, Mr. Taylor, the Director of the Library Center at Hampshire College has given a very exciting but at the same time highly realistic picture of the academic libraries of the Seventies. Though Mr. Taylor writes for the 'Hampshire College Library Center' he, with his foresight, professional experience and above all the profound understanding of the 'Malaise of Librarianship' puts a straight challenge to the so called modern librarianship. As a 'metalibrarian' he goes much beyond the librarianship and hits a very correct blow to the overconcern of the librarian with 'how' i.e. attention to methods and processes.

In explaining the theme of the book in the introduction he writes:

All institutions of higher learning have a place called the library, usually, spelled with a capital L. A great deal of money, time, and effort have been poured into the library. Because of an aura of mistaken veneration and misplaced emphasis, how-

ever, its potential for education has been largely neglected and its potential for providing the environment for an effective community has been overlooked. It is suggested that those who plan libraries during the 1970's examine rather closely what the library does and what it could do, to become a productive participant in the learning process and in the community it serves. This will be the last library of the kind with which we are familiar to be built on a campus. It will bear the burden of being a transition instrument to a new type of institution.

In the introduction and the first two chapters the theme is presented. Giving a brief summary of 'The Educational setting: Hampshire College' in the 1st chapter he defines the Hampshire College by quoting from 'The making of a college'.

Hampshire college is a new, independent, experimenting liberal arts college and it is a national pilot enterprise for innovation in American higher education. The objectives of this experimenting institute are laid down—indeed an excellent piece of literature, excellent set of objectives:

Background, philosophy and base points of Hampshire planning and description of schools and programmes will definitely guide our university planners in the right direction who every year add couple of new universities and adding the financial burden on tax payer without giving him anything new, and adding only traditional and conventional universities with which the country is already oversaturated.

Mr. Taylor very ably correlates and coordinates the library center of the Hampshire College in the chapter 2—'Extended and Experimenting Library'. The library is described in 'the making of a college'. He quotes:

The Library proper is far more than the ordinary conception of a library. It is the

educative aorta of the College. It should be by far, in every sense, the major building on the campus.... It should not be monumental, but it must be beautiful and alive, with the promise of the excitement of learning, with the civilized pleasure of being with other people who are learning, and with being in the midst of treasures of intellect and culture. The Library will house the College's main collection of books and periodicals in the usual sense. The Library will aim from the beginning to acquire materials selectively to avoid unnecessary duplication with the other four colleges and to support the nature and purposes of Hampshire. The Library will also strive to be financially economical in its selection of materials, both in acquisition of an initial collection and in seeking the best possible alternatives to standard letterpress books that present technology can provide.

The motto of Hampshire college—Non Satis Scire, to know is not enough. It is through self-awareness of one's relationship to his surround that he goes beyond knowledge to understanding and wisdom. Whether library has any role to play in achieving this motto? and so how far the library can play its role? Both these questions are answered with the vision of a 'metalibrarian' and 'a true generalist of the future'.

Very critical about the present day libraries which are book and print oriented libraries, the author while explaining the extended library concept, emphasise the need for the shift from a book and print oriented libraries to a communicative or media oriented libraries.

In the third chapter 'Translation into Bricks & Mortar', the author has evolved entirely new concepts of library building putting Metcalf and Elworthy—the Library Building Consultants as back dated. In India the University Grants Commission is the principal body to give liberal

grants for University Library Buildings to almost all the Universities of the country. In most cases they have wasted the financial assistance by constructing most inadequate, too bad library buildings which are not planned taking into consideration the library functions. Many Government and semi-government bodies also spent huge amount for the library buildings without consulting any library building experts. Their entire reliance on the architect for the library building planning has done a lot of damage to the library buildings of the fifties & sixties. The book provides many new aspects of the library building based on the ever changing concept of the library which should never be lost sight in planning the library buildings of the seventies in India.

The author being a professional librarian his assessment and critical evaluation of the Librarians and Libraries is really an eye opener to the profession in general and Indian Librarianship in particular. Telling about the malaise of Librarianship he writes, 'This attention to methods and processes has allowed the profession to talk only to itself.... the 'how' of Melvil Dewey has been the warp and woof of the profession since the late nineteenth Century. As a result of this what has happened to the profession? He puts in a very clear and direct term his assessment of Librarians as under:

"It also excluded the librarian with some notable exceptions from the company of intellectuals and from the academic seats of power. In short it made him a clerk and threatens now, as Leonard Freiser has implied, to make him 'The biggest garbage collector in history'".

In the light of this assessment if we assess the Indian Librarianship the same assessment is applicable to us with much more emphasis than what Mr. Taylor has said about the Librarianship in general.

—H. C. MEHTA

Round Up

P. M. Tells Students To Modernise Society

AN EARNEST appeal to students to give a lead in modernising the society and achieve progress of the nation was made by the Prime Minister, Mrs. Indira Gandhi while inaugurating the silver jubilee celebrations of Poona University. She said that the youth and students should turn their faces against forces of violence for destruction and rally together to defeat their actions. She was conferred the degree of the D.Litt *honoris causa* at a special convocation by Chancellor Nawab Yawar Jung.

She recalled her student days in Poona and said she was grateful that this university was now conferring this honour on her. "Poona," she said, "had taught her—as it had other generations—self help."

Referring to the opposition by certain "young, and others not so young, elements in Poona to the award of a degree to the Prime Minister," she asked whether they really intended that the Prime Minister and the universities should have no liaison at all. She emphasised that it was such elements which wanted to separate the universities from the mainstream of national development's. About the widespread discontent among youth over the university functioning, Mrs. Gandhi said, younger generation appears to be doubtful about its future and felt that

universities had degenerated into factories for turning out unemployed educated. Job-orientation was now being introduced but the role of universities should be more fundamental, she observed.

Student unrest, she assumed, was the result of a multitude of factors, including injustices, political influences, economic hardships, personal ambitions of workers, and an urge to change the social maladies, so old to this land.

The absence of any goals was perhaps the most significant. Universities should be centres of learning and knowledge said the Prime Minister, where the intellectual faculty was developed. But some political parties disturb their normal working, she added. She exhorted the youth to work with determination and faith to usher in a peaceful revolution. She pointed out that by resorting to violence, the students not only disturbed their studies, but also destroyed property. This was a negative approach which would never solve problems.

She said she had full faith and great hope in the younger generation. She was confident that the future of the country would remain very bright in their hands. It was the first duty of the students towards the

nation as well as their own interest to defeat such forces and groups. Mrs. Gandhi said some times it was said that politicalisation of education was one of the reasons for the difficult problems facing the country. I cannot say whether it is the cause or the result, she added.

It was also being suggested that all political parties should agree to remain aloof from universities but what was the guarantee that all political parties would agree on this issue. She wanted the universities to provide original thoughts so that the society could be better serviced. They should not merely remain institutions to impart education to youth. They should try to preserve and spread certain values.

Dr. G. S. Mahajani, Vice-Chancellor, recalled the progress made by the University during the 25 years of its existence. Mr. V. P. Naik, Chief Minister, congratulated the university on its achievements and said the university had upheld Poona's name as the seat of learning.

Earlier Mrs. Indira Gandhi laid the foundation stone for the scientific and technological museum proposed by the Poona University as an ambitious silver jubilee project.

Khan pleads for powers to remove VCs

THE Vice-Chancellors of the Universities in Uttar Pradesh met the Governor-Chancellor, Shri Akbar Ali Khan at Raj Bhawan in April in Lucknow. Among the various problems that came up for discussion were the financial position of the universities, student unrest, provision of meals for inmates of hostels at uniform rates.

Certain anomalies in the U.P. Universities Act of 1973 were discussed and it was suggested that they should be removed either by amending the Act or by making suitable provisions in

the statutes to be framed. The Chancellor asked the Vice-Chancellors to give their considered opinion on the various anomalies in the Act. He pleaded that enough power should be vested in the Chancellor for removing the Vice-Chancellors from office in the larger interest of the universities.

He wanted similar provisions which should enable the Vice-Chancellors to remove the teachers. This step would help to remove the overall indiscipline prevalent on the university campuses.

Mr. Khan also stressed the urgent need for finding the basic causes of student indiscipline and unrest. He suggested formulation of effective remedial measures.

The Chief Minister, Shri H. N. Bahuguna in his address emphasised that proper opportunities should be guaranteed to scheduled castes and scheduled tribes candidates for admission to courses of study in universities and colleges, specially in the science faculty. Part-time jobs and opportunities for students belonging to weaker sections during vacations should also be explored. The necessity for a teacher-parent rapport was also stressed. Similarly, the teacher-student relationship should also be improved.

Mr. Bahuguna informed the Vice-Chancellors that various steps had been taken by the Government to wipe off the accumulated deficits of universities over the years and similar steps were contemplated to wipe off the deficits of degree colleges. He emphasised the necessity to consolidate higher education in the State instead of expanding it any further. All round attempts should be made by the Government and universities to strengthen the existing institutions and degree colleges. He also emphasised the necessity of providing at least one hostel in each of the residential universities in the State in every year of the Fifth Plan. The conference was attended by the Vice-Chancellors and State governments officials.

Bihar VCs favour UGC Scales

A TWO-DAY conference of the Vice-Chancellors was called by the Bihar Government to discuss university affairs including the problems of students in Patna. The State Education Minister presided.

The Vice-Chancellors also held discussions with the members of the Cabinet Sub-Committee on education. It was suggested at the meeting that the revised scales of pay for university teachers should be accepted by the State government as early as possible.

The question of abolition of the Governing bodies of the affiliated colleges was also discussed. It was suggested that alternative arrangement should be worked out to replace the Governing Bodies which did not prove useful. A committee was appointed to go into the details of this question.

The decision of the Government to provide 7.5 kg. of food ration per student per month was welcomed and it was suggested that the scheme should be implemented speedily. A weekly review of the situation should be made at a higher level of the Government with a view to minimise difficulties arising in the implementation of the scheme.

Selection of Central VCs

The question of uniformity in selection, appointment and tenure of Vice-Chancellors of Central Universities was raised in the Lok Sabha during question-hour. Prof. S. Nurul Hasan, Union Education Minister replied that the question of bringing uniformity in the relevant provisions of Acts and Statutes of these universities would be considered as and when these Acts/Statutes are next amended.

So far as the Aligarh Muslim University, Delhi University and Jawaharlal Nehru University are concerned, the procedure for selection of the Vice-Chancellor and his tenure are the same. In Visva-Bharati, the Upacharya (Vice-Chancellor) is appointed from a panel of three names forwarded by the Karma-Samiti (Executive Council) to the Samsad (Court) with their recommendations in order of preference. If the first name in the panel is accepted by the Samsad by the majority of the members present and voting, the Paridarsaka (Visitor) will confirm the appointment. If, however, the first name on the panel is not acceptable to the Samsad, all the three names are put to vote and a fresh order of preference is recommended by the Samsad. Both the orders of preference are then forwarded to the Paridarsaka with the recommendations of the Karma-Samiti and of the Samsad and the appointment is made by the Visitor from among the said names. The Upacharya is to hold office for six years or till the completion of sixty-five years of age whichever is earlier.

In Banaras Hindu University, the Vice-Chancellor is appointed by the Visitor on the recommendation of a Selection Committee constituted by the Visitor for the purpose and he is to hold office for a term of three years and is eligible for re-appointment for a second term.

10 New Depts in Cochin Varsity

THE COCHIN University is planning to have ten departments from the coming session which will include a university library, department of youth welfare, institute of applied science and economics, and health science. The university is initiating a programme of collaboration with the Restock University in GDR. It is proposed to conduct a course in naval architecture in collaboration with the universities in Germany.

Ewing's College Humanities Improvement Programme

EWING CHRISTIAN College, Allahabad, started serious thinking in terms of certain possible changes in the teachings and activities in the arts faculty in the month of April 1973. After a constant and concerted effort of the staff members it was possible to start implementing the planned programme under its College Humanities Improvement Programme from July 1973.

The programme starts right from the time of admission. Though the college is still interested in maintaining the strength of the students at a high enrolment level for financial reasons and hence not able to be very selective, yet this year, a minimum number of marks were maintained in admission of students and measures were taken to try and check undesirable element from coming in.

Basically the programme is started at two levels—at departmental level and at inter-disciplinary level. At departmental level, keeping in view the need for change in the method of teaching, every arts department came out with certain proposals.

The changes made in the different departments can be grouped under the following categories:

1. The lecture system continued, by and large, but note dictating and repetition of test-books material was eschewed.

2. Smaller and more intensive seminars were introduced with large number of students participating in these.

3. Experiments, research projects and other kind of practical works were initiated more extensively. In some cases joint staff-student ventures were also introduced.

4. Frequent class tests through short answer tests or quizzes etc. were introduced.

5. Audio-Visual Aids were commissioned. For certain lectures help of a projector and Alpdiascope was also taken.

6. General Hindi classes were started for non-Hindi literature students and staff.

Paucity of fund and space, and limited staff, is holding up some more changes.

At inter-disciplinary level, the achievement has been much encouraging. Though under this programme, the enrolment of students was optional, but students came out in good number. On certain basis all the Arts departments were divided under six groups. And with a main subject other few subjects were attached. In this Programme, various topics relating to different subjects were pre-determined.

In each group such lectures were held once a week. The idea

behind these lectures was to give the students some knowledge about the related subjects other than they study. Knowledge of one subject may help in the understanding of other subjects. Lastly students may get opportunity to know the wider perspective of one or related topics different from the water tight compartment of the syllabi. They were given cyclostyled outlines or summary of the lectures. Such lectures attracted the students and on the basis of certain observation it was found that they wanted more than one lecture in a week.

An objective type examination based on the above mentioned lectures was conducted at the end of January 1974. The pre-determined scoring system was followed in this examination and on the basis of distribution suggested by U.G.C. grades A, B, C, & D were given. As an incentive, certificates to the successful students will be awarded.

Education for all



"We agreed to pass the students irrespective of their marks. Now they are demanding that admission should be un-restricted..."

FIFTY three delegates from twenty-seven Commonwealth countries met in New Delhi in March at the invitation of the Commonwealth Secretary-General to participate in the first meeting of the Commonwealth Youth Affairs Council. The meeting reviewed the progress made since Commonwealth Ministers concerned with youth matters met in Lusaka in January/February 1973 and decided on the establishment of the Commonwealth Youth Programme. Delegates represented at this meeting in almost all cases were senior officials concerned with youth programmes in their country. The Delhi meeting examined specific proposals for accelerating the implementation of the Commonwealth Youth Programme.

The meeting was preceded by three Regional Planning Meetings held in February and March 1974 at Georgetown, Lusaka and New Delhi to consider establishment of these Commonwealth Regional Centres for Advanced Studies in Youth Work in the Caribbean, Africa and Asian regions. Reports of the three Regional Planning Meetings were received and endorsed. The three Centres are expected to become operational later this year.

Participants indicated their national needs and priorities in the field of youth activities and urged the Commonwealth Secretary-General to respond to these needs quickly because of their urgency.

Shri Shahid Alikhan, Joint Secretary to the Government of India, Ministry of Education and Social Welfare, was elected Chairman of the meeting. The meeting was convened by the Commonwealth Secretariat and hosted by the Government of India who provided all facilities for this meeting as well as for the Planning Meeting for the Commonwealth Regional Centre for Advanced Studies in Youth Work, and the Commonwealth Regional Seminar on Adult Education and National Development held in Delhi simultaneously.

Addressing the opening session, Shri P. N. Haksar, formerly Principal Secretary to the Prime

Commonwealth Youth Programme

Minister of India, urged the delegates to consider youth as an integral part of society and to seek their active involvement in developing their own communities. "Lecturing to them from the pulpit", he said, "does not provide solutions to any of their problems".

Commenting on the Commonwealth Youth Programme, the Commonwealth Secretary-General recalled that a considerable amount of preparatory work had been done. Following a series of five Regional Seminars on Youth and Development held in Trinidad, Kenya, Malaysia, Malta and Cyprus, Commonwealth Ministers concerned with youth matters decided at their meeting at Lusaka early in 1973 to establish the Programme. This decision was endorsed by Heads of Government at their Meeting in Ottawa in August 1973. While briefly commenting on the elements included in the Programme, the Secretary-General laid special emphasis on generation of employment opportunities for unemployment school leavers and provision of facilities for young people for their self-expression and development. He did not regard the Youth Programme as an aid programme, since industrialised countries had as much to learn as any other Commonwealth country from shared experience. He expressed the hope that member countries of the Commonwealth would participate in the activities under the Programme on a basis of equality and shared experience. He was confident that the Youth Programme could make a major impact on the needs and priori-

ties of youth in Commonwealth countries.

Mr. Smith warmly commended the caretaker Continuation Committee for their efforts in refining the various elements of the Programme and urged the newly inaugurated Council to adopt a pragmatic and realistic approach.

The programme is funded by voluntary contributions from participating governments and non-government sources. Enthusiastic support for the Programme was clearly in evidence from all member countries of the Commonwealth represented at the meeting. Twenty countries have firmly pledged to contribute to the Programme, whose initial target was set at £1 million for the period ending June 1976. Approval was given for a budget of over £500,000 for the next year.

The Council welcomed the involvement of voluntary and non-governmental agencies in the Programme as a symbol of the spirit of co-operation which animates the Commonwealth.

The New Delhi meeting also established continuing machinery to guide the Programme during the year. It elected Mr. O. B. Sey of the Gambia as Chairman of the Commonwealth Youth Affairs Council for the next year and agreed that the Committee of Management comprising representatives of 11 Commonwealth countries — Australia, Bangladesh, Barbados, Britain, Canada, Ghana, Guyana, India, Malaysia, Nigeria, and Zambia — be constituted to see the implementation of the Programme.

Gujarat University Launches Training Scheme

THE GUJARAT University under the Half-a-million-jobs Programme has started a scheme for training 125 unemployed graduates from 20th of March this year onwards. Before the scheme was launched, prolonged discussions were held between the prospective employer-group and the university authorities. Various training programmes were designed after consultation with them. The training is in five specified areas i.e., Office Management, Financial Management, Banking Management, Export Business Management and Material Management. These courses are to be conducted by the Centre for Management and Professional Training under the Gujarat University. The Centre has been established by the university with a view to provide six months intensive and full-time courses to the graduates who are unemployed and who want to increase their employability by acquiring practical knowledge and detailed information on various operational aspects of business, industry, and public institutions and enterprises. The centre aims at meeting the needs of both the employment agencies and unemployed graduates by providing work-oriented training through suitable educational methods and on the job training in variety of private and public business organisations.

There will be two sessions during the year. The first will be from 15th January to 31st of June and the second from 1st of July to 31st December. Each course will be of six months' duration. The courses are on full time basis and trainees will have to appear for heavy schedule of work and study.

The training will also involve

practical training, writing assignments, field studies, reading assignments and participation in discussions, seminars and workshops. Preference for admission will be given to graduates who are unemployed and have secured a good second class degree. Candidates with diploma in mechanical and electrical engineering will also be considered for admission to the Export Management and Material management courses. Under the scheme, the trainees during the period of training will be provided stipends ranging between Rs. 150 and Rs. 400 per month.

Proposal for Cess on Industry

A TWO-Day symposium on "diversification of engineering degrees and diploma courses for effective employment" was held recently in Bangalore. Prof. S. V. C. Aiyar, former Director of the National Council of Educational Research and Training in his key-note address suggested that a small cess be levied on industries for financing engineering education as the various industries in the country were dependent upon the technical advice of the engineers in some way or the other. He also suggested the diversification of a portion of the funds meant for finding jobs for the unemployed so that it became a more meaningful source for generating employment. He said that the diversification of engineering education offered opportunities for specialisation and study in depth and not merely acquisition of a vast mass of superficial knowledge.

Mr. Mallikarjunaswamy, Education Minister of Karnataka in his inaugural address stressed

the need of making engineering education practical-oriented. He said that in the absence of practical bias many industries preferred to take those who had done short-term courses in various trades. This restricted the scope of employment of the engineering students and resulted in lot of frustration. Mr. R. L. Kirloskar, Managing Director of Kirloskar Electric Company in his presidential address emphasised the importance of exposure of the engineering faculty to the basic realities of the industries. He said that it would be beneficial both to the teachers and the engineers if they came closer together. He wanted engineering education to be modified to the needs of the industries.

Computers in Education Conference

THE SECOND World Conference on "Computers in Education" organised by the International Federation for Information Processing (IFIP) under the High Presidency of the French Ministry of National Education is scheduled to be held in the first week of September 1975 in Marseilles (France) under the patronage of UNESCO, OECD, LEC, and in collaboration with ICMI.

The conference aims at bringing together people concerned with the many possible roles of Informatics in Education. One of the important aspects of the conference will be the consideration of use of the methods of Informatics and the applications of computers to aid in the solution of the problems of education in developing countries. An exhibition is also proposed to be organised during the conference.

Madurai University Convocation

A Supplementary Convocation was held by the Madurai University at the University Senate Hall. Dr. M. Varadarajan, Vice-Chancellor of the university presided over the function. A total of 1200 candidates were awarded their degrees at the function.

International Intervisitation Programme

THE FIRST International Intervisitation Programme was held in U.S.A. during 1966 under the sponsorship of the University Council for Educational Administration. The second programme was held at the University of New England in Australia in 1970. This led to the formation of the Commonwealth Council for Educational Administration and the decision to hold a third programme in the U.K. in 1974. Another result was the founding of the British Educational Administration Society in October 1971.

The main purpose of the International Intervisitation Programme is to promote the development, in an international setting of systematic study and research in educational administration, based on firm theoretical foundations in the social sciences and designed to improve teaching and practice at both system and institution levels. The theme of the programme in educational administration—New Directors in Practice and Theory—will be the focus of the third International Programme to be held in Bristol, Glasgow and London during July 6th to 27th this year. A week will be spent in each of these centres and visits will be arranged throughout the period of the programme. Discussions would be held around these three themes: (1) **Location of decision making**—Local/central government relations; community involvement; professional-administrative roles in decision-making (2) **School and college organisation**—Role of head or principal. Inspection and supervision. Curriculum development. Structuring of schools and colleges for teaching and administration. (3) **Study of educational administration**—Politics in education. Modern management approaches and techniques in relation to education. Preparation and in-service

Programme for administrative roles.

Joint AICS, IOA Panel for Sports Development

A MEETING of the All-Indian Council of Sports and the various National Sports Federations was held in Delhi in April under the Chairmanship of Gen. Kumaramangalam. Discussion regarding the development of respective sports and difficulties faced by the federation in the organisation of their activities were reviewed. Though no concrete decisions were taken but it was decided to have a joint panel of AICS and IOA to consider the difficulties in the management, organisation and promotion of sports in the country.

Mr. Shahid Ali Khan, Joint Secretary in the Union Education Ministry explained the guidelines circulated by the Govern-

ment to the different sports federations for sending the sports teams abroad. It was made clear that there was no desire on the part of Government to interfere in the autonomous working or the activities of the federation. But the Ministry's financial and other assistance shall be extended only to those organisations which fulfil guidelines laid down by the Government. Some of the salient features of the guidelines are: (1) No person has been or can be office-bearer in national organisations consecutively for more than one term or three years or, at the most, two terms or six years in the event of unanimous election for a second term; (2) That no office-bearer of a national organisation is at the same time an office-bearer of any other national organisation; (3) Annual accounts of the organisations should be properly maintained and regularly audited; (4) The Federations and associations should appoint national coaches with the prior approval of AICS.

Seminar on Student Services

A THREE-Day Seminar on Student Services was organised at Sri Venkateswara University, Tirupati with the financial assistance from the University Grants Commission.

The necessity of making the student services programme an integral and essential part of higher education has been realised for some time. But now there is an urgent need to maximise the educational output at all levels. It was felt that the student services should range from the orientation programme to initiate the newcomers to colleges/universities studies to vocational and placement facilities to the outgoing students. With these points in view, the seminar was focussed on the

various aspects of student services. The following were some of the recommendations of the 4th seminar :

1. Student Services should be organized in all institutions,
2. As a first step in the organisation, the existing services should be strengthened and improved,
3. The following are suggested as the minimum necessary services for educational institutions.
 - (a) Reading and Recreational facilities
 - (b) Facilities for Board and Lodge
 - (c) Medical and Health Services

- (d) Student Advisement facilities
 - (e) Advisement for choice of courses and career
4. As a step in ensuring these facilities, the concerned authorities such as the Universities and Government Departments of Education may be required to initiate action. While granting and confirming existing affiliations, the provision of student services and facilities may be made a necessary condition; also a student-teacher ratio of 10:1 may be maintained.
 5. In Service Orientation courses, programmes of short duration courses for teachers may be organised. The Universities may take up this responsibility.
 6. Orientation programmes for fresh students may be organised.
 7. Needy students may be aided by providing part-time employment.
 8. Professional Counselling Services may be made available to those students who require them.
 9. The organisation of Student Services in specific institutions may be made taking into account the needs and resources of these particular institutions.
 10. It is suggested that this Seminar may be followed by a workshop involving Heads of Institutions, faculty members, student rep-

representatives and parents to chart out a model scheme on Student Services for implementation.

Sports Medicine Conference

THE FOURTH Annual Conference of Indian Association of Sports Medicine would be held at Patna from May 12 to 13. The Indian Association of Sports Medicine is sponsoring the conference to discuss problems concerning this specialised field of sports activity. The Association is a technical body having the advisory status to the All India Council of Sports and is affiliated to the International Federation of Sports Medicine. The conference is expected to be attended by the leading experts of sports medicine and persons concerned with physical education in the universities and other sports bodies in the country.

New Institute of Development Studies

THE MYSORE University in collaboration with the Ford Foundation has decided recently to start an Institute of Development Studies in Mysore. The Institute will also collaborate with the Institute of Development Research in Denmark. It is expected that a comprehensive socio-economic survey of Karnataka would be taken up in the first instance. The Institute will also organise a scientific study of socialism.

Maharashtra Universities Bill Passed

THE MAHARASHTRA Legislative Assembly recently adopted bills aimed at bringing about uniformity in the laws governing the functioning of all the six universities in the State. The amendments to various university legislations are likely to improve the financial and administrative efficiency.

Under the new act there will be increased representation for teachers and students on the various university bodies. The procedure for the appointment of the vice-chancellor has also been changed from "nomination by the chancellor" to "Delhi Pattern".

Personal

1. Prof. D. N. Sharma has been appointed as Vice-Chancellor of Patna University.
2. Prof. M. V. Mathur has taken over as the Director-General of the National Council of Applied Economic Research (NCAER).
3. Dr. Ramkaran Sharma has taken over as the Vice-Chancellor of Darbhanga Sanskrit University.
4. Dr. S. Vidyalkar has been appointed as the Vice-Chancellor of Gurukul Kangri University.
5. Sri Pandey Shree Kant Sharma has been appointed Registrar of the Patna University.

Kerala Varsity Bill Adopted

THE KERALA University Bill was recently adopted by the State Assembly. The Bill provides for radical changes in the structure of the university bodies. For the first time in the country, student representative will be going to the Syndicate of the university. The other important feature of the amending Act is that the Government can now constitute a Board to manage the affairs of a private college for a period not exceeding two years on a report from the university that its work could not be carried on because of wilful closure, failure to discharge obligatory duties or gross mismanagement.

It has been further provided in the case of minority institutions that government shall nominate to Board only members from the minority community, which established and administered the private college.

U. N. Committee on Science and Technology meets

THE Committee on Science and Technology for Development, at a session held from 11 to 29 March, recommended the establishment of a task force to deal with the urgent problems of the arid zones, and called on the organizations of the United Nations system and on developed countries to assist the developing countries in combating the "brain drain" of trained personnel from the poorer to the wealthier nations.

At the three-week session; the Committee also recommended the creation of an inter-governmental working group to examine the specific objectives and agenda for a proposed United Nations Conference on Science and Technology advocated by the Secretary-General. However, it did not take a position on whether such a conference should be held.

The Committee, meeting at United Nations Headquarters adopted a number of measures aimed at making it possible for new areas of research and development to be added to the lists of priority areas included in the World Plan of Action for the Application of Science and Technology to Development, as well as the four regional plans associated with that document. It also suggested ways of mobilising public opinion behind those plans.

The Committee commended the report of an Inter-governmental Group of Experts which it had requested at its last session to study ways of measuring the effort which countries devote to applying science and technology for the development of developing countries. It recommended that Governments continue their efforts to establish data systems so as to obtain the information necessary for the development of their

science and technology programmes.

At the session just concluded, the Committee did not return to the more controversial aspect of establishing quantitative targets for scientific and technological activities—an issue which led to disagreement between developed and developing countries at the Committee's first session, held in New York from 12 March to 9 last year.

The Committee, which was meeting for the second time since its establishment in 1972 by the Economic and Social Council, reached all its decisions by consensus. Its Chairman, Joao Frank da Costa (Brazil), expressed the view at the closing meeting that the technical nature of the session had been a contributory factor. He recalled that the first session of the Committee had been an argumentative one and added that although perhaps it had not technically been constructive it might have been politically useful.

He viewed the Committee as a body which could gradually become the focal point for the formulation of a science and technology policy for the United Nations.

In other actions during the session, the Committee:

- Recommended that it be authorized to act as the central point in the United Nations systems or activities concerning the application of computer technology for the benefit of development;
- Called for a feasibility study on the establishment of an international information exchange system on technology transfer and assessment aimed at ensuring that the technology which reaches developing countries is

appropriate for their particular needs;

- Recommended that there should be no change in its technical and consultative character, the general methods of work and the number of members of the Advisory Committee on the Application of Science and Technology to Development (ACAST) a 24-member body of experts appointed in their personal capacity by the Economic and Social Council;
- Requested the Secretary-General to prepare for its next session in 1976 a comprehensive report listing the various United Nations bodies concerned with science and technology and indicating their responsibilities, major programmes and resources;
- Agreed on a number of medium-term objectives at which a unified science and technology policy for the United Nations should aim.

The Committee decided not to act, because of lack of agreement among its members on a draft resolution aimed at providing additional resources to the Secretariat for the work assigned to it in the field of science and technology. It also decided to refer to the World Food Conference, scheduled to take place in November the question of the establishment of a special protein fund.

Scholarships for Undergraduate Studies

For the first time, scholarships are to be given by the Ministry of Education and Social Welfare for under-graduate studies abroad. These will cover first degree courses such as B.A., B.Sc. and B.A. (Honours). Of the eight scholarships being awarded this year, four are for Humanities and Social Sciences and an equal number for Natural and Physical Sciences. These are out of a total of 50 National Scholarships for study abroad being offered this year. Thirty are for post-graduate studies leading to Ph. D. degree and 12 for post-doc-

toral research and specialised training.

These scholarships are meant to encourage meritorious students who do not have the means to go abroad. They are open only to candidates whose parents or guardians are earning less than Rs. 1,000/- per month.

Forty students have been sent to United Kingdom and the United States of America during the past year and an expenditure of nearly Rs. 33 lakhs to be incurred by the Government on their studies.

Adult Education

THE EDUCATIONAL experts of the Asian countries of the Commonwealth expressed the opinion that a unified policy of adult education should be evolved to serve national plans and policies. In spite of serious attempts to spread literacy the number of illiterates was on the increase due to enormous growth of population.

It was stressed at the commonwealth regional seminar held in New Delhi that the concept of life-long education should form part of the future educational development.

It was felt that non-formal education of the adults alongside formal training in schools and colleges would considerably help eradicate illiteracy in the developing countries. The adult education could go a long way in bridging the gap between different sections of urban population and develop in them a civic community sense in the context of ever-increasing process of urbanisation.

It was generally thought at the seminar that the structure of staffing for adult education would require not merely full-time administrative organisers but also voluntary teachers whose enthusiasm should be maintained by full Government support. But the training for adult educators should be suited to the needs of beneficiaries.

Swedish Award for AIIMS Chief

THE "KAROLINSKA Institute Medicinska," the leading medical Institute of Sweden has decided to award the honorary degree of Doctor of Medicine to Prof. V. Ramalingaswami, Director of the All-India Institute of Medical Sciences, New Delhi. The award will be presented to him on June 4 in Stockholm.

Prof. Ramalingaswami is internationally known for his work on nutrition. He was only recently awarded Rs. 50,000 by the Medical Council of India for his brilliant works. He is the first Indian to get this award from Karolinska Institute which is one of the five leading medical institutions in the world and has mostly nobel laureates on its faculty. Prof. Ramalingaswami was also awarded the honorary D.Sc degree by the University of Oxford only two years ago.

M. Sc. Course in Molecular Biology

THE MOLECULAR Biology Building of the Madurai University constructed at an estimated cost of Rs 4,70,000 with the assistance of the University Grants Commission was recently declared open by Prof. J. Mandelstam. The university proposes to conduct M.Sc. course in Molecular Biology from the academic year 1974-75.

Pondy Varsity Proposal

THE QUESTION of setting up of a Central University at Pondicherry has been engaging the attention of the Union Government. Recently the Government has set up a committee under the Chairmanship of Dr. George Jacob, Chairman, University Grants Commission, to work out the details of the proposal for establishment of a Central University at Pondicherry. The committee is expected to submit its report shortly.

Vocational Courses

THE BANGALORE University from the coming academic session would provide for vocational-biased job-oriented diploma courses for the benefit of the general degree seeker students. The university has also decided to upgrade the content of the general knowledge paper introduced last year for all college courses including medicine and engineering courses to a full paper. Though it will not be obligatory for the students to pass in this paper, but marks obtained in it would help them in obtaining a rank. The university would be providing other courses to make education really purposeful and the vocational courses would inculcate among the youth a spirit of self-reliance and self-confidence.

Intellectuals From Varsities Invited

EMINENT intellectuals from the universities of Sri Venkateshwara, Osmania, Andhra and Agricultural University—were invited to hold discussions with the President of the Andhra Pradesh Congress Committee, Mr. V. Venkatanarayana. The dialogue was initiated with a view to build up link with the intellectual community in the State.

Prof. Rasheeduddin Khan, MP, Prof. B. Sarveswara Rao, Prof. C. Lakshmananna, Prof. J. Suryanarayana, Dr. K. V. Narayana Rao, Dr. B. Prasada Rao, Dr. N. Balakrishna Reddy, Mr. K. V. Ramana and Mr. M. Madhava Rao, were some of the members of the academic community who pondered over the economic crisis, political unrest and atmosphere of violence which prevailed in the country as a threat to democracy. Their advice was sought to devise ways and means to divert the youth, particularly the students, towards constructive channels.

CLASSIFIED ADVERTISEMENTS

UNIVERSITY OF JODHPUR

(Establishment Branch)

Advertisement No. 3/74.

Application are invited for the following posts:—

(A) Readers in the Department of—Mechanical Engineering, English, Economics, Commerce, Botany, Chemistry, Zoology, Philosophy, Law, Civil, Structural (temp.) and Pol. Science (likely to be made permanent).

(B) Lecturers in the Department of:—Hindi, Political Science, Comparative Literature, Philosophy, Sociology, Commerce, Botany, Zoology, Home Science, Geography, Law, Music, French, Statistics, Electrical Engineering, Civil Engineering (temporary), Mining Engineering and Structural Engineering (Architecture).

(C) Overseer : (Civil & Electrical).

(D) Professional Assistant—Library.

Scales of Pay

(A) Reader : Rs. 700-50-1250.

(B) Lecturers : Rs. 400-40-800-50-950.

(C) Overseer : Rs. 180-10-220-15-385-20-425.

(D) Professional Assistant : 250-20-450-25-625.

Posts carry allowances and other benefits as may be admissible under the rules of the University from time to time.

Qualifications :

(A) Reader : Mechanical Engineering, Civil Engineering & Structural Engineering: Essential: (a) A first or high second class Bachelor's degree of an Indian University or equivalent qualification of a foreign University in the subject concerned; (b) Experience of teaching and/or professional experience for six years. Desirable: Postgraduate degree and/or research experience. Specialisation for Mechanical Engineering: Heat, Power I.C. Gas Turbines or Industrial Engineering and Operational Research.

Reader—English, Economics, Botany, Chemistry, Philosophy, Political Science and Zoology: Essential: (a) A first or high second class Master's Degree of an Indian University or equivalent qualification of a foreign University in the subject concerned; (b) A research Degree of a Doctorate standard or some published work; (c) Experience of teaching postgraduate classes for at least five year. Desirable for Zoology: Specialisation in any of the following branches: Parasitology, Animal Physiology, Animal Ecology, Entomology, Toxicology and Linnology.

Reader—Mining Engineering

Essential:

(a) A first or high second class Bache-

lor's degree of an Indian University or equivalent qualification of a foreign University in the subject concerned or A.I.S.M. in Mining Engineering.

(b) Professional experience for six years in mines/teaching research.

Desirable :

(c) Post-graduate degree and/or research experience and/or published work of merit.

(d) First class Manager's Certificate of competency under metalliferous Mines Regulations 1961.

Experience for at least two years in a responsible capacity not below the rank of Assistant Manager in large underground Metalliferous Mines.

Reader—Law: Essential: (a) A first or second class Master's degree in Law or first or second class degree in Law with a postgraduate in Humanities or Social Sciences; (b) Experience of teaching postgraduate and/or degree classes for five years or at least five years practice at the bar. Desirable: Specialisation in Jurisprudence, or International Law, or Labour Law, or Administrative Law or Criminal Law; or Criminology, or Constitutional Law or Family Law, or Comparative Law.

(B) Lecturer in the Department of: Hindi, Political Science, Philosophy, Geography, Sociology, Botany, Zoology Statistics.

Essential: A first class Master's degree in the subject concerned or second class Master's Degree with three years experience of teaching degree classes or a second class Master's degree with Ph.D.

For Zoology: Persons with a Master's Degree in any of the Life Sciences (Microbiology, Biochemistry, Molecularbiology) may also be considered.

Lecturer for Statistics: Desirable: Must be well conversant in some of the following fields:—

(a) Advance Theory of Sample Surveys

(b) Advance Applied Sample Surveys

(c) Advanced Theory of Design of Experiments

(d) Operational Research

(e) Numerical Analysis

(f) Information Theory

(g) Stochastic Processes

(h) Probability and Measure.

Lecturer in Commerce: Essential: A first Class Master's degree in Commerce or Business Administration or Second Class Master's Degree with three years experience of teaching degree classes or a second class Master's degree with Ph. D.

Lecturer in Law: Essential: A first or second Class Master's Degree in Law or first or high Second Class Degree in Law with three years teaching or three years practice at bar.

Lecturer — Music (Instrumental & Vocal): Essential : (i) Sangeet Praveen

of Madhav Music College, Gwalior or (ii) Sangeet Nipun of Bhatkhande Sangeet Vidyapeeth, Lucknow or (iii) M.A. in Music of a recognised University or (iv) a first class degree of Sangeet Visharad of Bhatkhande Sangeet Vidyapeeth, Lucknow or (v) A first class degree of Sangeet Prabhakar of Rajasthan Kala Sanshan, Jaipur or (vi) A first class degree of Sangeet Ratan of Madhya Bharat Departmental Examination Gwalior or (vii) Second class degree of Sangeet Visharad, Sangeet Ratan or Sangeet Prabhakar as mentioned above plus B.A., degree with Music from a Statutory Indian University or (viii) Sangeet Pravin Examination of Prayag Sangeet Samiti, Allahabad or (ix) Sangeet Bhaskar Examination of Pracheen Kala Kendra Chandigarh or (x) Alankar examination of the Gandnarva Mayavidyalaya, Bombay.

Lecturer in Structural Engineering (Architecture) : Essential: (a) A first or high second class Bachelor's degree of an Indian University or equivalent qualification of a foreign University in the subject concerned (b) Experience of teaching or practical work for two years; Desirable: Postgraduate degree and research experience. Professional experience as an Architect.

Lecturer — French : (a) Essential: (i) A first or second class Master's Degree in French or Diploma in French with at least a second class M.A. in English or an Indian Literature; (ii) Experience in teaching French; (iii) Proficiency in translation from and into French (b) Desirable: Knowledge of additional languages.

Lecturer in Civil Engineering & Electrical Engineering: Essential : (a) A first or high second class Bachelor's degree of an Indian University or equivalent qualification of a foreign University in the subject. (b) Experience for two years in research and/or teaching and/or practical work. Desirable: Postgraduate degree and/or research experience and/or published work of merit.

Lecturer in Deptt. of Mining Engg. (For Assaying and Metallurgy).

Essential: (a) A first or high second class Bachelor's degree of an Indian University or equivalent qualification of a foreign University in Metallurgy; (b) Experience for two years in research and/or teaching and/or practical work in Plants.

Desirable: Postgraduate degree and/or research experience and/or published work of merit or experience in Professional capacity including one year experience in Assaying and analysis of ores and fuels.

Lecturer in Comparative Literature and Language Studies: Essential: A first or second class Master's Degree in an Indian or European Language, thorough knowledge of Indian literature and the Indian Languages/translations;

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A list of select articles culled from periodicals received in AIU Library during March-April 1974

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- Dyne, Larry Van. "5 Analyse new religious element in youth movements". *Chronicle of Higher Education* 8(11); 3 Dec 73 : 6.
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- Vasanth Ramchandra. "Relevance in undergraduate courses". *University News* 11(12); Dec 73 : 7.
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- Conway, Bryony. "Pooling problems and experiences". *Times Higher Education Supplement* (126); 15 Mar 74 : 14.
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- Elton, Charles F. and Rodgers, Sam A. "Departmental rating game : Measure of quantity or quality?" *Higher Education* 2(4); Nov 73 : 439-46.

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- Semas, Philip W. "Faculties at the bargaining table". *Chronicle of Higher Education* 8(10); 26 Nov 73 : 9-14.
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- Packard, David. "Unrestricted gifts aid hostile scholars". *Chronicle of Higher Education* 8(8); 12 Nov 73 : 6.

Classified Advts.

(Continued from page 27)

experience in teaching language or literature concerned.

Desirable: (i) Knowledge of one or more Indian Languages with ability to teach at elementary level (ii) Proficiency in translating from Indian Languages into English and *vice-versa*. (iii) Experience in journalism or research or comparative study of Literature. Applications should contain full particulars about Languages known and degree of proficiency in each. Specimen of published work (if any) should be submitted.

Working knowledge of Hindi is necessary for all posts of Lecturers.

Overseers (Civil & Electrical): Essential: Diploma holder in Civil/Electrical Engineering. Graduate in Engineering in the branch concerned preferred.

Professional Assistant (Library): Essen-

tial: Graduate with degree or diploma in Library Science with 7 years experience as Librarian.

Qualifications as mentioned above may be relaxed in case of candidates who are otherwise found suitable. Higher starting salary is possible to exceptionally qualified candidates. Persons applying from abroad will be considered in absentia. Mere advertisement does not place the University under obligation to fill the posts. Those who have already applied for the following posts in response to previous Advertisements as mentioned below need not apply again. They may, however, intimate on plain paper if they have obtained any additional qualification or added any papers or any change in the address:—

Readers: Mechanical Engineering — 7/71, 5/72, 2/73; **Economics —** 6/70, 4/71, 8/71, 4/72, 2/73; **Commerce —** 6/70, 4/72, 2/73, **Botany —** 8/71, 4/72, 2/73; **Chemistry —** 4/70, 6/70, 8/71, 4/72, 2/73; **Zoology**

— 4/72, 2/73; **Law —** 8/71, 4/72, 2/73.

Lecturers: Hindi — 7/71, 8/71, 4/72, 5/73 **Political Science —** 5/73; **Sociology —** 2/71, 8/71, 4/72, 2/73; **Commerce —** 6/71, 7/71, 8/71, 4/72, 2/73; **Civil Engineering (Architecture) —** 4/72, 2/73; **Zoology —** 4/72, 2/73; **Geography —** 6/70, 8/71, 4/72, 2/73; **Law —** 7/71, 8/71, 4/72, 5/72, 2/73; **Music —** 3/70, 4/71, 4/72, 2/73; **Statistics —** 2/73.

Professional Assistant — 7/73.

Application forms can be obtained from the undersigned for which a crossed Indian Postal Order for Rs. 2/- endorsed in favour of the Registrar, Jodhpur University payable at Jodhpur be sent along with a self-addressed envelope of 24x11 cms. bearing postage stamps of 40 paise. The last date for receipt of application is 27th May, 1974. The Vice-Chancellor may at his discretion condone delay in receipt of applications.

S. Chakrabarti
REGISTRAR.

PHYSICAL SCIENCES

Mathematics

1. Samar Singh. Some problems of information transmission over discrete memoryless channels. Indian Institute of Technology, Delhi.

Physics

1. Ashutosh Singh. Optimum multiple frequency generation in collisional plasmas. Indian Institute of Technology, Delhi.
2. Dawar, Avinashi Lal. The dielectric behaviour of nitrogenous aromatic liquids and ionic powders at microwave frequencies. University of Delhi.
3. Om Prakash. Some studies of the atmospheric gravity wave effects on the F region of the ionosphere. University of Delhi.
4. Rakesh Kumar. An investigation into the strain distribution in thin flat plates due to oversize inserts by the Moire technique. University of Delhi.
5. Sahale, Baburao Parbatrao. Theoretical studies on molecular vibrations by Green's function analysis and molecular quadrupole moments of N_2 and O_2 . Shivaji University.

Chemistry

1. Chavan, Anilkumar Dattajirao. Mechanism of hydrolysis of some organic hydrazides. Shivaji University.
2. Gupta, Shri Prakash. The synthesis of potential anti-cancer compounds. Kanpur University.
3. Hasan Mukhtar. Chemical studies on drug metabolism in relation to enzyme induction. Kanpur University.
4. Mehrotra, Siddh Nath. Studies on some new metal sequestering agents. Kanpur University.
5. Panda, Rama Krushna. Electron transfer reactions. Berhampur University.
6. Tewari, Upendra Swarup. Physico-chemical properties of organic melts. Indian Institute of Technology, Delhi.
7. Yemul, Shrishailam Sayanna. Isolation and structure elucidation of wood phenolics. Shivaji University.

Earth Sciences

1. Basu, Aniruddha. Structure and metamorphism of Singhbhum group of rocks in Dhalbhumgarh—Nischintpur Area, Singhbhum, Bihar. Indian School of Mines, Dhanbad.
2. S. N. Prasad. Studies of paleomagnetism and magnetic properties of newer dolerites from Singhbhum: Their application to igneous activity in the area. Indian School of Mines, Dhanbad.
3. Sahay, Gopalji. Some studies on Siwalik sediments around Kotdwara, Garhwal Himalaya. University of Delhi.

Engineering and Technology

1. Agarwala, Ram Avtar. Characteristics of atmospheric noise in the evening transition period. Indian Institute of Technology, Delhi.
2. Rajkumar, Christopher. Elastic analysis of short span continuous folded plates. Indian Institute of Technology, Delhi.
3. Sharma, K. L. S. State estimation applications to power system problems. Indian Institute of Technology, Delhi.
4. Sinha, Anjani Kumar. Modelling and identification of stochastic system. Indian Institute of Technology, Delhi.
5. Thakkar, Manharlal Chimanlal. Some studies on optimization in concrete structures. South Gujarat University.

6. Ved Ram Singh. Silicon strain gauge transducer instrumentation for industrial, medical, engineering and scientific applications. Indian Institute of Technology, Delhi.

BIOLOGICAL SCIENCES

Biochemistry

1. Baldev Krishana. A study of the biosynthesis of phospholipids in *Pythium irregulare* (Buisman). Punjab Agricultural University.
2. Venkateswerlu, G. Studies in trace elements metabolism. Osmania University.

Botany

1. Kulkarni, Purshottam Deokrishna. Primary productivity of periphyton and macrophytes in Sayaji Sarovar at Baroda. M. S. University of Baroda.
2. Pushp Lata. Effect of ionizing radiation on roses with special reference to induction of mutations. Kanpur University.

Zoology

1. Adwant, Prakash Dhondiraj. Taxonomy and biology of nematoceros diptera with special reference of family Cecidomyiidae (Itonididae) from Marathwada. Marathwada University.
2. Sethi, Jaspal Singh. Histochemical mapping of certain enzymes in the forebrain and midbrain of some Indian lizards. University of Udaipur.
3. Yazdani, Sayed Sohail. Studies on the biology, morphology and control of spotted bollworm, *Earias fabia* (Stoll). Bhagalpur University.

Agriculture

1. Aggarwal, Gian Chand. (1) Soil water evaporation in the falling rate stage: An analytical approach; and (2) New techniques for the determination of root growth and seedling emergence forces. Punjab Agricultural University.
2. Amar Bahadur Singh. Genetic studies of some quantitative characters in Indian mustard. Kanpur University.
3. Awadhesh Narain Singh. Nitrogen uptake by *Ricinus communis* (Linn.) in relation to sources, level and methods of nitrogen application. University of Udaipur.
4. Bhandari, Jaswant Singh. Factors affecting persistency and dropout of adult literacy classes in Udaipur District. University of Udaipur.
5. Brar, Joginder Singh. Significance of mineral forms of nitrogen in plant nutrition under aerobic and anaerobic conditions. Punjab Agricultural University.
6. Kapur, Madan Lal. Contribution of sub-surface layers of the soils of nitrogen, phosphorus and potassium nutrition of crops. Punjab Agricultural University.
7. Mishra, Kamlesh Chander. Effect of pesticides on soil microorganism and their activities. Kanpur University.
8. Sher Bahadur Singh. Ammonium fixation in soils of Uttar Pradesh. Kanpur University.
9. Shrivastava, Rishidev Lal. Studies on nutrition of dwarf wheats. Kanpur University.
10. Tiwari, Rajender Nath. Studies on physiological basis of weed control. Kanpur University.
11. Vishnu Prasad. Resource use efficiency and level of production in multiple cropping in Farrukhabad District, U.P. Kanpur University.

Veterinary Science

1. Mathur, Charan Swaroop. Effect of protein nutrition on production and quality of wool. University of Udaipur.
2. Popli, Trilochan Singh. Some biochemical-pharmacological studies with general anaesthetics chloroform and halothane in different combinations in calves. Punjab Agricultural University.

SOCIAL SCIENCES

Psychology

1. Banerji, Debadatta. Development of cooperative and competitive behaviour and its relationship with need for achievement (n. Ach.). University of Udaipur.
2. Mohammad Sovef. Interactional study of childrearing practices and some personality dimensions of criminals. Bhagalpur University.
3. Tandan, Veera. Attitudes of women of Pauri-Garhwal of Uttarakhand and city of Kanpur towards family planning. Kanpur University.

Sociology

1. Sohi, Inderjit. Impact of telecast messages on rural women : An empirical study. Indian Institute of Technology, Delhi.

Economics

1. Mehta, Mahesh Kumar. Madhya Pradesh ke janjatiya kshetron mein samudayik vikas yojnaon ke pragati ka alochanatmak adhyayan. Jabalpur University.
2. Tiwari, R.S. Public expenditure in Madhya Pradesh since 1956. Jabalpur University.

Commerce

1. Bansal, Vijay Kumar. Bharat mein sehkari prabandh ka prashikshan-vishleshatmak adhyayan. Jabalpur University.

Political Science

1. Chaudhuri, Pabitra Kumar. A glossary of the political terms of Ancient India upto the 7th century A.D. University of Gauhati.
2. Das, Naranarayan. The anti-rightist campaign in China 1957-58. Jawaharlal Nehru University.
3. Shaileshwar Nath. Terrorist movement in Bihar. Bhagalpur University.

Education

1. Sharma, Motilal Ramlalji. An investigation into organizational climate of secondary schools of Rajasthan. M.S. University of Baroda.

HUMANITIES

Philosophy

1. Jain, Shanti. Jaina mysticism. University of Udaipur.
2. Verma, Madhuri. Swami Vivekanand's contribution to the religion. Ranchi University.
3. Vyas, Girija. A comparative study of ethical teachings in the Gita and the Bible. University of Udaipur.

Literature

English

1. Choudhury, Saradindu Hom. Shakespeare criticism from Dryden to Morgan. University of Gauhati.

2. Das, Brajendra Chandra. P.B. Shelley and W.B. Yeats : A comparative study. University of Gauhati.

3. Mathur, Saran Behari. The technique of point of view in American fiction : A critical study of its theory and practice, by some selected modern American writers of the South. University of Udaipur.

4. Sarma, Gobinda Prasad. Indo-Anglian fiction : A study of Indian nationalism as reflected in it from the beginning till 1947. University of Gauhati.

Sanskrit

1. Jain, Premchand. Udyotsurikrit Kuwalymala katha ka sanskritik adhyayan. University of Udaipur.
2. Pandey, Radha Kant. Kundanmala tatha Uttar Ram-charit nutak ka tulnatmak adhyayan. Kanpur University.
3. Pathak, Moolchandra. Sanskrit ke natakon mein ati prakrit tatva. University of Udaipur.

Hindi

1. Anja, Bhawarlal. Mehmur prafesheya sahitya ka adhyayan evam mulyankan, 1600-2000. University of Udaipur.
2. Joshi, Kailash Narain. Adhunik Hindi upanyason mein swapan manovagyan. University of Udaipur.
3. Maheshwar Prasad Singh. Sant kavi Mehi Das : Vyaktitva aur krititva. Bhagalpur University.
4. Pandey, Ram Shankar. Shri Vinod Shankar Vyas : Vayaktitva evam krititva. Jabalpur University.
5. Purohit, Gajanan Shivnath. Prasad aur Nanlal ke kavyon ka tulnatmak adhyayan. M.S. University of Baroda.
6. Tripathi, Ram Swarup. Dwivediyageen kavya parampara ke sandharbh mein Pandit Raja Ram Shukla rashtriya atma ke kavya ka anusheelan. Kanpur University.
7. Verma, Ram Niranjana Kumar. Unisvin shatabdi ke uttardh mein Bihar ki Hindi sadhna aur uska mulyankan. Bhagalpur University.

Urdu

1. Jahgirdar, Abdurraheem Ahmadqadri. Urdu nasr ka Dehli dabistan. Shivaji University.

Assamese

1. Katakya, Chandra Nath. Studies in Modern Assamese poetry, 1846-1965. University of Gauhati.

Marathi

1. Savant, Vasant Ladu. Arvacheen Marathiteel pravasaranne 1800-1965 : Ek vandmaya prakar ya drishtine abhyas. Shivaji University.

History

1. Ansari, Asghar Ali. The relations between South Arabia and the Deccan from 17th till 23th century. Osmania University.
2. Bhawmik, Swarnakamal. Early copper and bronze technology of Gujarat. M.S. University of Baroda.
3. Parashar, Hargovind. Bankrit Harshcharit ka rajnetik evam sanskritik adhyayan. Jabalpur University.

4. Shrivastava, Rekha. Swai Madho Singh-I Jaipur, 1723-1749. University of Udaipur.

Geography

1. Ansari, Sultan Ahmed. Economic geography of Manipur. University of Gauhati.

SAMBALPUR UNIVERSITY JYOTI VIHAR, BURLA

Advertisement No. 14488/TDS.

Dated 16-4-74

WANTED

1. Professor—One in Physics.
2. Reader—One each in Oriya, Economics, History, Mathematics, Physics, Chemistry and Biological Sciences.

All the posts except the post at Sl. 1 are temporary but are likely to be made permanent).

Scales of Pay

Professor—Rs. 1100-50-1300-60-1600/-

Reader—Rs. 700-50-1250.

Age of Retirement—Sixty years.

Qualification :—(1) *Professor of Physics* : (i) At least a 2nd Class Master's Degree in the subject with 48% of marks, (ii) High Research qualification preferably a Doctorate (iii) Capacity for conducting and guiding Research work, (iv) Teaching experience for at least ten years in a college or University with at least 5 years' experience in teaching P.G. classes, (v) Specialisation in one or more of the following areas:—

- (1) Nuclear Physics, (2) Particle Physics, (3) Instrumentation, (4) Electronics, (5) Solid State Physics.

2. (i) (a) *Reader in Oriya/History/Economics/Mathematics/Physics/Chemistry* : At least a 2nd Class Master's Degree in the respective subject with 48% of marks.

(b) *Reader in Biological Sciences* : A 2nd Class Master's Degree in Biological Sciences or Botany or Zoology or Biochemistry with 48% of marks.

(ii) Teaching/Research experience for at least 8 years out of which at least 5 years must be in Teaching in a college or University.

(iii) Active Research and capacity to guide Research Work.

(iv) Specialisation in one or more of the following areas

- (1) *Oriya*—(a) Modern Oriya Literature (b) Poetics—Theories and Principles of Literary criticism, (c) Comparative Indian Literature.

(2) *Economics*—(a) Public Finance, (b) Monetary Economics, (c) Agricultural Economics, (d) International Economics, (e) Economics of Industry and Labour, (f) Economics of Public utilities and transport.

(3) *History*—(a) History of Orissa, (b) Ancient Indian History.

(4) *Mathematics*—(a) Algebra, (b) Topology, (c) Differential Topology, (d) Algebraic Geometry, (e) Automorphic Functions, (f) Complex manifolds, (g) Number theory, (h) Potential theory, (i) Numerical Analysis, (j) Operations Research, (k) Fluid Mechanics, (l) System theory.

(5) *Physics*—(a) Solid State Physics, (b) Nuclear Physics, (c) Particle Physics, (d) Electronics.

(6) *Chemistry*—(a) In Organic Chemistry (knowledge in quantum chemistry or Nuclear chemistry will be regarded as additional qualification).

(7) *Biological Sciences*—(a) Biochemistry (knowledge in Bio-Physics, Biophysical Chemistry and Molecular Biology will be regarded as additional qualification).

v. Experience in teaching at P.G. Level

will be regarded as additional qualification for all the subjects.

All the posts above carry dearness allowance as sanctioned by the University from time to time.

Seven copies of application forms will be supplied from the University Office to each candidate in person on cash payment of Rs. 2 (Rupees two) only. Candidates intending to receive forms by post are required to send (a) a crossed Indian Postal Order of Rs. 2 payable to the Finance Officer, Sambalpur University, (b) a self-addressed envelope (23 cm. x 10 cm) with postage stamps worth Rs. 2 affixed to it with the words "APPLICATION FORM FOR TEACHING POSTS IN THE SAMBALPUR UNIVERSITY" superscribed on it. Money orders or Cheques will not be entertained.

The last date of receipt of application in the office of the University, at Jyoti Vihar, Burla, Sambalpur (Orissa) is the 20th May, 1974.

The selected candidates will be required to join within one month from the date of the issue of the appointment order. The candidates will be required to appear for an interview at their own expense before Selection Committees. Issue of this advertisement does not make it binding on the part of the University to make the appointments.

Suitable persons may be appointed on contract basis on a higher initial pay if it is deemed desirable in the interests of the University.

All communications should be addressed to the Registrar by designation only and not by name.

REGISTRAR

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY POWAI, BOMBAY 400076

Advertisement No. 770

Admission to Master's Degree Programme in Engineering (M. Tech.) 1974-75 Session

APPLICATIONS are invited for admission to the following courses leading to the Degree of Master of Technology (M. Tech.) in : (i) Aeronautical Engineering, (ii) Chemical Engineering, (iii) Civil Engineering, (iv) Electrical Engineering including Electronics, (v) Mechanical Engineering and (vi) Metallurgical Engineering.

Following a comprehensive review of the postgraduate educational pattern, significant changes have been introduced in the Master's Degree programme of the Institute from the academic year scheduled to commence on 22nd July 1974. In the new programme, the courses are being organised on a semester basis with the credit system replacing the time-based system. The student has the option either to obtain a General Master's Degree in any branch of Engineering (without specialisation) or to specialise in a particular elective group offered by a Department. The flexibility in the programme allows the student a wide choice of courses offered both within and outside the department as well as in certain interdisciplinary areas. The Master's Degree programme is now open for full-time regular students, Practising Engineers sponsored either as full-time or part-

time students or non-sponsored part-time students. The duration of the programme thus becomes varied from a minimum of 3 semesters (18 months) to a maximum of eight semesters (4 years approximately).

Scholarships of Rs. 250 p.m. are awarded to unsponsored full-time students admitted to these courses tenable for a maximum duration of 23 months. Hostel accommodation is available to all students.

Candidates are selected by a test and interview held in July 1974 at the Institute at Bombay. The candidates called for interview are to meet their own expenses.

Minimum Qualifications:

Candidates with a Bachelor's degree or equivalent as recognised by the All-India Council for Technical Education in the appropriate branch of Engineering (Aeronautical, Chemical, Civil, Electrical, Electronics, Tele-communication, Mechanical and Metallurgical) with a minimum Cumulative Performance Index of 5.5 or with at least 55 per cent of marks in the qualifying examination are eligible for seeking admission. Graduates in Civil, Electrical and Mechanical Engineering are also eligible for admission to the Aeronautical Engineering branch. Some of the electives in the Mechanical Engineering branch are also open for graduates in Aeronautical and Metallurgical Engineering. Some of the electives in the Metallurgical Engineering branch are also open to graduates in Chemical and Mechanical Engineering.

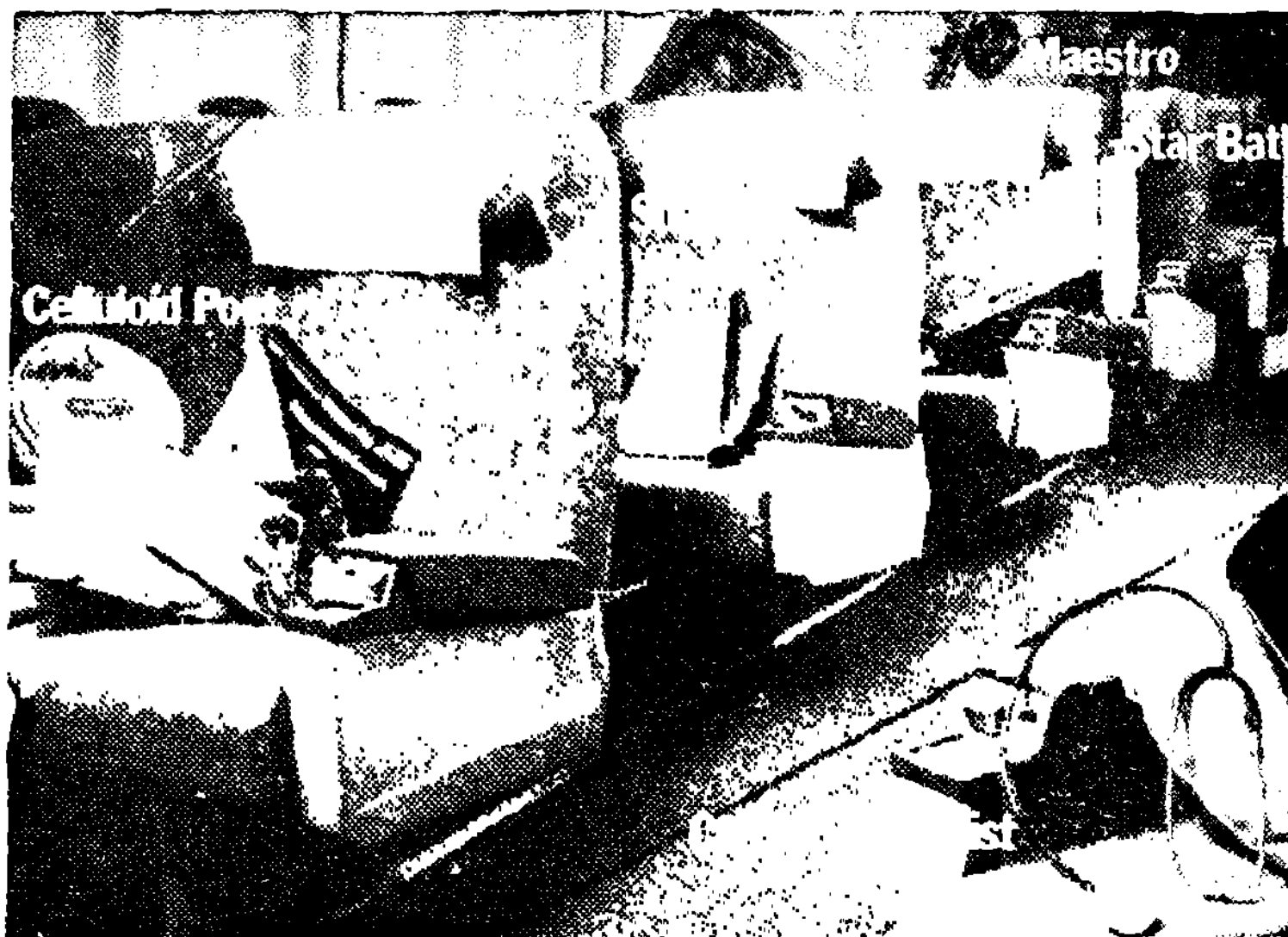
Candidates with a Master's degree in Physics with Wireless/Electronics/Radio Physics, as special subject(s) are also considered for admission to some of the elective groups in Electrical Engineering provided they have passed the qualifying examination with at least 60 per cent of marks.

Candidates belonging to Scheduled Caste/Tribe will be considered for admission provided they have obtained atleast 50% of marks at the qualifying examination. Special consideration will be shown to them in matters of admission. They are also exempted from payment of tuition fees.

Candidates who have appeared at the corresponding qualifying examination and are awaiting results are also eligible to apply.

Information brochure and application forms : Information brochure giving detailed information records electives offered etc. and application forms can be had from the Deputy Registrar (Academic) by enclosing a self-addressed stamped (60 Paise) envelope of size 23 x 18 cm and superscribed 'Admission M. Tech. course in..... (Mention here branch of Engineering)'. Completed applications with Indian Postal Order for Rs. 5 must reach the Deputy Registrar (Academic) by 15th June, 1974.

Postal requests for application form, received without a self-addressed, adequately stamped and duly superscribed envelope of the appropriate size, or received after 7th June, 1974 will not be entertained.



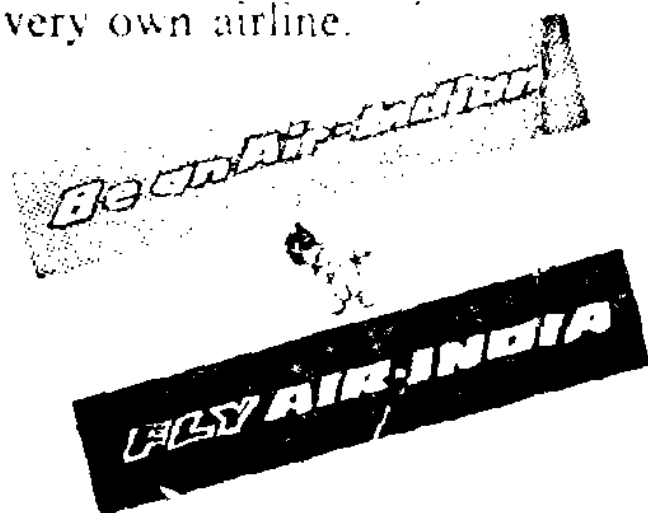
The Air-Indians.

You know them, we fly them.

Who are the Air-Indians?

You know them all. They are Indians who have put their country on the world's industrial map, Indians who have carried the liquid notes of their music to distant lands, Indians whose films have lent a lyrical vision to world cinema, Indians whose feet have transmitted the rhythm of Indian dance across the seas, Indians who are leaders in sport, in science, in technology. Air-Indians are Indians who are proud of their country, proud to fly their country's airline.

When you fly Air-India, you fly with your people, your culture and your flag. In fact, when you fly Air-India, you fly your very own airline.





Prime Minister Indira Gandhi receiving the Hon. Degree of Doctor of Litt.
from Poona University Chancellor Ali Yavar Jung.

INDIAN INSTITUTE OF TECHNOLOGY, POWAI, BOMBAY 400076

Advertisement No. 771

Admission to M.Sc. courses in Science subjects 1974-75 Session.

Applications are invited for admission to M.Sc. courses in:

- (1) Applied Geology—Duration 3 years
- (2) Chemistry—Duration: 3 years
- (3) Mathematics—Duration: 2 years
- (4) Physics—Duration: 2 years

The courses are scheduled to start on 1st August, 1974. Students are required to reside in the Institute Hostels.

Candidates will be required to appear for interview and a written test at the Institute at Bombay at their own expenses on an assigned date.

The Institute provides financial assistance in the form of scholarships and freeships. Scholarships of Rs. 75/- p.m. each are awarded to 25 per cent of students admitted to each course. In addition 10 per cent of the students may be awarded free tuition on grounds of need.

MINIMUM QUALIFICATIONS

Applied Geology:

A Bachelor's Degree in Science with Geology as the Principal subject and Physics or Chemistry or Mathematics as other subject(s) with at least 55 per cent marks at the final examination.

Chemistry:

A Bachelor's Degree with Chemistry (main) and Physics (subsidiary); or Physics (main) and Chemistry (subsidiary) or Chemistry, Physics and Mathematics, with at least 55 per cent marks at the final examination.

Mathematics:

A Bachelor's Degree with Mathematics (Major/Main) and Physics (Minor Subsidiary), or with Mathematics, Physics and Chemistry, with minimum 55 per cent marks at the final examination.

Physics:

A B.Sc. (Hons.) Degree with Physics (main), Mathematics (subsidiary) or Mathematics (main), Physics (subsidiary) or B.Sc. with Physics, Chemistry and Mathematics with at least 55 per cent marks at the final examination.

CANDIDATES BELONGING TO SCHEDULED CASTE/TRIBE WILL BE CONSIDERED FOR ADMISSION PROVIDED THEY HAVE OBTAINED AT LEAST 50 PER CENT MARKS AT THE FINAL EXAMINATION. SPECIAL CONSIDERATION WILL BE SHOWN TO THEM IN THE MATTER OF ADMISSIONS AND AWARD OF SCHOLARSHIPS AND FREESHIPS.

Notwithstanding the above, a candidate possessing Bachelor's Degree in Engineering of this Institute and wishing to seek admission to M.Sc. courses in Physics, Chemistry, or Mathematics may be considered on individual merits

of the case.

Candidates who have appeared for the corresponding qualifying examination in May/June 1974 and are awaiting results are also eligible to apply.

The course in **APPLIED GEOLOGY** comprises course work on different subjects, work on an assigned problem and geological field work. The specialisation would largely be in the areas of Engineering geology, Mineralogy, Petrology and Economic geology.

The course in **CHEMISTRY** offers excellent opportunities for training in Chemistry on modern lines. This includes Quantum Chemistry, Statistical thermodynamics, Solid State Chemistry and Physics, Crystal and molecular structure, Chemical and Electrochemical kinetics, Physical, Organic and Inorganic Chemistry, Reaction mechanism, Natural Products Chemistry, Co-ordination and Analytical Chemistry, Chemical instrumentation and Application to analytical problems.

The course in **MATHEMATICS** offers excellent opportunities for a broad based training in Mathematics on modern lines. The contents cover basic areas of Pure and Applied Mathematics, with Statistics and Operations Research and Numerical Analysis and Computer Programming. In the second year some scope is provided for advanced training in one of these areas. The course is designed to make it useful either for teaching and research in Mathematics or industry oriented careers.

The course in **PHYSICS** has been designed to give the students a good preparation in the basic subjects such as Classical and Quantum Mechanics, Electromagnetic theory and Mathematical Physics. Workshop practice and Electronics are taught to all students by engineering faculties. In second year there is scope for specialisation in certain branches of Physics.

Application forms can be had from the Deputy Registrar (Academic) by enclosing a self-addressed stamped (60 Paise stamp) envelope of size 23 x 10 cms superscribed "Admission M.Sc. course(s) in". Completed applications with Postal Order(s) of the value of Rs. 5/- must reach the Deputy Registrar (Academic) by 20th JUNE 1974.

Postal requests for application form, received without a self-addressed, adequately stamped and duly superscribed envelope of the appropriate size, or received after 13th June 1974 will not be entertained.

INDIAN INSTITUTE OF
TECHNOLOGY, BOMBAY POWAI,
BOMBAY 400 076

Advertisement No. 772

**ADMISSION TO POSTGRADUATE
DIPLOMA COURSES IN ENGINEERING
(1974-75 SESSION)**

APPLICATIONS are invited for admis-

sion to the following Postgraduate diploma courses (DIIT): Civil Engineering Department 1) DOCK AND HARBOUR ENGINEERING, 2) APPLIED HYDROLOGY, Electrical Engineering Department 1) COMPUTER SCIENCE.

The DIIT courses are of one academic year's duration. The courses are scheduled to start on 22nd July 1974. Scholarships of Rs. 250/- p.m. are awarded to unsponsored students admitted to these courses. Hostel accommodation is available to all students.

Candidates will be selected by a test and interview at the Institute at Bombay. The candidates are to meet their own expenses for interview.

Minimum Qualifications:

Dock and Harbour Engg: At least a second class Bachelor's degree in Civil Engineering.

Applied Hydrology: At least a second class Bachelor's degree in Engineering or a good Master's degree in Science (Physics, Chemistry, Mathematics, Geology, Geophysics, Meteorology, Agriculture).

Computer Science: (a) At least second class B.E./B. Tech. degree in Electrical Engineering, Electronics communications or Telecommunications from a recognised University or equivalent degree or (b) M.Sc. in Physics (with Electronics) or (c) As a special case, B.E. or M.Sc. degree in other areas of specialization, may be admitted, provided they have sufficient background in Electronics and Mathematics.

Candidates who have appeared at the corresponding qualifying examination and are awaiting results, are also eligible to apply.

Experience in a relevant field will be considered desirable qualification. Other things being equal, candidates with experience in the relevant field and those sponsored by Government, Quasi-Govt. Educational or Industrial Organisations will be given preference.

CANDIDATES BELONGING TO SCHEDULED CASTE/TRIBE WILL BE CONSIDERED FOR ADMISSION PROVIDED THEY HAVE OBTAINED AT LEAST 50 PER CENT MARKS AT THE FINAL EXAMINATION. SPECIAL CONSIDERATION WILL BE SHOWN TO THEM IN THE MATTER OF ADMISSIONS. THEY ARE EXEMPTED FROM PAYMENT OF TUITION FEES.

Application forms can be had from the Deputy Registrar (Academic) by enclosing a self-addressed stamped (60 Paise) envelope of size 23x18 cm. and superscribed "Admission DIIT course in"

Mention here Branch of course.

Completed applications with Indian Postal Order for Rs. 5/- must reach the Deputy Registrar (Academic), by 15th June 1974.

UNIVERSITY NEWS

Vol. XII
No. 6



JUNE
1974

A Monthly Chronicle of Higher Education

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Opinions expressed in the articles and reviews are individual and do not necessarily reflect the policies of the Association.

Editor : ANJNI KUMAR

Explosion For Peaceful Purposes

On 18th May, 1974 India emerged as the world's sixth nuclear power. Unlike the other nuclear countries, India is wedded to the peaceful use of nuclear energy. The main objective of our atomic research programme, however, has been to keep abreast of international developments in nuclear technology. The Indian scientist have strived all the years to make radio-active substances available for use in medicine and agricultural research and for generating electrical power with nuclear technology. Mr. Jawaharlal Nehru had declared as early as 1957 that "we shall never use this atomic energy for evil purposes." He stuck to that position even under great provocation, when the country was subjugated to various attacks from the neighbouring countries in 1962. Prime Minister Indira Gandhi has also reassured the world at her recent press conference that the underground explosion in Rajasthan was for peaceful purposes and India has no intention of producing nuclear weapons but wants to keep herself up-to-date with nuclear technology for use in mining and earth moving operations etc.

The memorable historic event of May marks the fulfilment of the dream of the architect of modern India — late Pt. Nehru and the two great scientists of the country Dr. Homi Bhabha and Dr. Vikram Sarabhai. Dr. H.N. Sethna, Head of the Atomic Energy Department and Dr. Raja Ramanna, Director of the Bhabha Atomic Energy Research Centre, Bombay deserve special congratulations. The fact that the whole exercise cost the nation only about 162 crores of rupees and was purely indigenous device, devoid of any foreign assistance needs to be further applauded.

In years to come, India will strive to perfect and produce even more sophisticated instruments for peaceful purposes like canal excavation, underground storage, natural gas stimulation, underground mining, oil stimulation and gas fire extinction.

The future developments in this field will clearly show the intentions of the country and will prove beyond any doubt that nuclear capacity need not be coterminous with the development capability for nuclear destruction.

The Emerging Student Power in India

UNTIL yesterday Indian students were a part of the system. Today they have chosen to step outside the system and attack it, so to speak. This is the principal significance of the recent events in Gujarat.

There was a time, and that was before 1947, when Indian students were in the vanguard of the national movement. After 1947, however, the situation underwent a drastic change. The character of the student body came to be drawn more and more from the middle classes or those who aspired to enter the charmed circles. Whatever development took place went to strengthen the hold of the middle classes over the productive system and the fruits that were to be obtained from it. No wonder, therefore, that what excited the students was either such problems as went to protect their privileges or made the academic process easier. When most people around them were making easy money there seemed to be no good reason why, in preparation for such a career, they could not also get through college without having to exert themselves.

Cheating in examinations became so widespread that anyone who talked of integrity or academic standards found himself out of step with what was happening around him. In this situation students came to be known either as delinquents or as philistines who were interested in securing the plums of life for themselves. The kind of idealism which one associates with the youth appeared to be completely missing.

What Gujarat has done is to call into question this stereotyped image of the Indian students. It is possible to say now that idealism still exercises a powerful pull upon the university youth. The Gujarat students have not only given evidence of a high degree of idealism; they have shown something more too. They have shown grit and staying power of which no one ever suspected them. More than that, they have also shown considerable tactical ability. To

Dr. Amrik Singh, Director, South Delhi Campus of Delhi University, points out in this article that the student's indifference to social issues is fast receding. With the economic situation worsening almost everyday and the political system reeking with corruption, all the pre-conditions of an explosive situation exist.

have demanded the resignation of the State Ministry was obvious enough. What they did was to demand the dissolution of the Assembly as well. There is no evidence to suggest that in the second demand they were inspired by any outside political forces. This demand appeared to emerge as the logical culmination of the struggle they had waged for the dismissal of the Ministry.

That the students are unable to function as a unified force even after their demand was conceded should not come as a surprise to those who have studied the pattern of student movements in other countries. It is rarely that students are able to provide political leadership. That is usually done by political parties. What students do is to provide the cadres.

In the Gujarat situation they seem to have provided both the leadership and the cadres. This combination, however, is not likely to endure. Already there are signs of strain. The leadership that emerged during the struggle is finding it difficult to retain its hold over the general mass of students. Indeed, students are being split up into factions and the factions are fighting one another. This pattern of developments was witnessed in West Bengal not so long ago, and there is little reason to believe that the pattern will be very different in Gujarat.

The explanation for this phenomenon is not far to seek. Unity of functioning is generally achieved as a result of the unity of beliefs. What exists among the students today is not the unity of beliefs so much as the unity of perception. In terms of perception most of them have discovered that the system into which they were seeking entry was not able to grow and expand in proportion to their growing needs and expectations. The number of those seeking employment was much larger than the jobs available. While this had been the pattern for a number of years, the slow rate of growth in recent years made the situation more and more difficult. Discontent, therefore, began to build up. What brought it to the boiling point were two factors.

One was the general stink of corruption. The second was the phenomenal rise in prices accompanied by scarcity of goods. As if in a flash, the students began to perceive that most of these things were inter-related. To protest against one was also to protest against the other things. Going a step further, they also began to perceive that it was not a question of the replacement of one individual by another. What was required was a change of the system.

It cannot be said that all this was clearly thought out or expressly articulated. That would have required a degree of purposeful thinking that the students were on the whole incapable of. But they had enough understanding to see that the corrupt elements in public life should be attacked ruthlessly, and not only as individuals but also as a part of the structure in which they were all bound. But inevitably and remorselessly, it gathered mass and momentum. That the students were ultimately able to have their demands accepted was because of the genuinely widespread support to them and the considerable tactical sense displayed by them. Whether this

pattern gets repeated elsewhere or not is difficult to prophesy. But one thing may be said with a certain amount of definiteness.

In the political crisis which has gripped the country for some years now, students are going to play a more and more important role. How long the crisis lasts, what turns and twists it takes and what precise role is played by students are questions which no one can answer with any certainty. But this much may be predicted as long as the crisis lasts, the students are not going to be passive spectators as they were till a few months ago. More and more of them will get drawn into struggles which have unmistakable political overtones. In certain cases the existing political parties will be able to manipulate and use them. In certain other cases this may not come to pass. But there should be no doubt that the past 1947 phase of indifference to social causes is fast receding and the next phase in the student world will be one of active involvement and increasing concern with social issues.

To infer from all this, however, that a substantial number of them will stop behaving in a delinquent fashion would be to ignore the damage done to student psyche during the last quarter century. Delinquency has come to be almost a part of the make-up of our students. In all likelihood the state of delinquency will exist side by side with the growing politicisation of students. To the extent, however, they become more and more politicised, delinquency as a state of mind will get weakened. But this process may neither be all that neat and decisive nor a swift one.

What does the process of politicisation precisely mean? It means no more and no less than the involvement of newer and newer segments of the population in political struggle. And once the students too join the struggle, as seems to be happening, the fat may be said to be in the fire. Students are volatile, reckless and, when uncontrolled, destructive. They have the capacity to get ignited and to ignite others. With the economic situation worsening almost everyday and the political system reeking with corruption, all the preconditions for an explosive situation exist. There is one important element missing and the students may come to play a role there too.

For several years now the Opposition has criticised the ruling party for its various acts of omission and commission. But none of them has yet provided an alternative strategy of action. This has been a signal failure of the Indian political system. There is no evidence to show that the political parties, whether of the left or the right, are beginning to give a better account of themselves. It seems, however, that events are overtaking them. To what extent they can adjust themselves to the changing contours of the crisis remains to be seen. One thing that the intervention of students has made clear is that a solution of the crisis can neither be postponed nor delayed. In other words, without possessing the capacity for leadership the students may oblige the political parties to redefine their strategies of action as well as their alignments.—INFA □

A Note

Trends in Higher Education in India

DR. H. N. PANDIT

THE educational expenditure (at current prices) has increased from Rs. 114 crores in 1950-51 to Rs. 880 crores in 1968-69 as against the growth in the national income (at current prices) from Rs. 9,530 crores to Rs. 28,808 crores during the same period. Thus, the expenditure on education has become eight fold while the national income has become only three fold during the last two decades. The share of higher education in the total scheme of expenditure on

education has increased from 24.84 per cent in 1950-51 to 32.23 per cent in 1968-69. It is also observed that the burden of financing of total education has considerably increased in the budgetary provision of the Central and State Governments during the last 20 years. For 1973-74, the Central and State Governments provided Rs. 1,413 crores for education as against Rs. 8,250 crores for all the developmental and non-developmental sectors of the economy. In terms of State budgets, the provision for education amounted to 22.7 per cent and with respect to the Central Government budget it amounted to 2.2 per cent. Further, the cost-benefit analysis of Indian education carried out by Harberger (1966), Kothari (1967), Nalla Gounden (1967), Blaug and his colleagues (1969) and Pandit (1973) conclusively has proved that the Indian education is top heavy and bottom weak. In other words, the whole system looks like an inverted pyramid. The rates of return on investment, both from social and private points of view, are lower for the higher education than those for the primary and secondary education.

Structural Changes

The higher education sector has registered a growth rate of 51.1 per cent during the five year period from 1966-67 to 1970-71. The aggregate enrolment in the higher education has increased from 17.63 lakhs in 1950-51 to 25.74 lakhs in 1968-69. The growth rates by stages of education may be seen from Table 1.

TABLE 1
Growth in Higher Education in India by Stages
1966-67 to 1970-71

S. No.	State	Percentage of enrolment		Percentage increase (+) or decrease (-)
		1966-67	1970-71	
0	1	2	3	4
1.	Pre-University	21.6	18.5	+29.30
2.	Intermediate	6.7	6.7	+50.6
3.	Graduate			
	(a) 2 year	5.4	6.7	+88.3
	(b) 3 year	42.3	48.8	+74.4
4.	Professional and Technical graduates	14.7	11.4	+17.1
5.	Post-graduate	6.0	6.2	+56.9
6.	Others	3.3	1.7	+22.4
7.	Total	100.0	100.0	+51.1

*Author is Project Officer, (Economics of Education), Research Cell of the Association of Indian Universities.

It is observed from the table that the 2-year graduate courses have registered 88.3 per cent increase as against 74.4 per cent in the 3-year graduate courses in arts and science during the five year period. The professional and technical graduate courses have increased by 17.1 per cent. The growth at postgraduate level has been of the order of 56.9 per cent. As a result of varying growth rates, there has been a structural change in higher education from 1966-67 to 1970-71. It is observed the share of pre-university courses and professional and technical graduate courses has declined whereas the share of graduate and postgraduate courses has increased. However, share of intermediate enrolment has remained constant during the period under discussion.

Statewise Imbalances

Growth rates of higher education have not been uniform from State to State during the period 1966 to 1970. The States have been classified according to the percentage increase during 1966-67 to 1970-71 in Table 2. Andhra Pradesh and Mysore registered percentage increase of 70 to 80 per cent, whereas States of Jammu & Kashmir, Maharashtra, Orissa, Rajasthan, Uttar Pradesh, Tamil Nadu and Delhi showed percentage increase varying from 50 to 70 per cent. Assam, Gujarat, Haryana, Himachal Pradesh, Kerala, West Bengal and Bihar showed percentage increase varying from 30 to 50 per cent. Madhya Pradesh and Punjab have shown growth rate of 20 to 30 per cent. Allocation of different States according to percentage increase may be seen from the table.

TABLE 2

Allocation of States According to Percentage Increase during 1966-70

S. No.	Percentage increase (1966-67 to 1970-71)	State
0	1	2
1.	20-30	Madhya Pradesh, Punjab
2.	30-40	Assam, Gujarat,
3.	40-50	Haryana, Himachal Pradesh, Kerala, West Bengal, Bihar
4.	50-60	Jammu & Kashmir, Maharashtra, Orissa, Rajasthan
5.	60-70	Uttar Pradesh, Tamil Nadu, Delhi
6.	70-80	Andhra Pradesh and Mysore.

Growing and Declining Sectors

Different sectors of specialization of higher education have also grown at varying rates. In Table 3 growing and declining sectors of higher education have been shown.

TABLE 3

Growing and Declining Sectors of Higher Education 1966-70

S. No.	Specialisation	Percentage increase (+) or decrease (—)	Percentage 1966-67	Percentage 1970-71
0	1	2	3	4
Growth Sectors				
1.	Commerce	+98.5	9.7	12.8
2.	Arts	+69.6	39.6	44.4
3.	Other Professional Education	+54.3	0.2	0.3
4.	Law	+53.5	2.6	2.6
5.	Science	+38.5	32.5	29.8
6.	Medicine	+12.2	4.3	3.5
7.	Education	+5.9	3.2	2.2
Declining Sectors				
8.	Veterinary Science	—18.2	0.4	0.2
9.	Engineering and Technology	—14.3	5.7	3.2
10.	Agriculture	—14.0	1.8	1.0
11.	Total Percentage No. in lakhs	51.1	100.0 17.03	100.0 25.74

Interestingly, Commerce specialization has shown 98.5 per cent increase during the five year period. Arts courses at graduate and postgraduate level have shown an increase of 69.6 per cent. The other Professional and Law courses have shown almost a uniform increase between 53-54 per cent. Science courses have shown an increase of 38.5 per cent and enrolment in Medicine has increased by 12.2 per cent.

Enrolment in Veterinary Science, Engineering and Technology and Agriculture courses has declined. As a result of uneven growth rates in enrolment, 'speciality mix' in higher education has changed its character between 1966 to 1971. Actual position may be seen from Cols. 3 and 4 of the Table 3. □

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Education and Teaching In Universities

S.G. PRABHU-AJGAONKAR

THE decimal system of numerical notation, the concept of zero and the foundations of Indeterminate Analysis were discovered by the ancient Indian Mathematicians. However, this original work of a high level was not continued further in India after the 12th century. It was only at the beginning of the present century that original research along modern lines began to spring up.

Curricula and courses in sciences have failed to evolve at a pace commensurate with the rapid growth of scientific knowledge. Subsequently in 1959 the University Grants Commission appointed "Reviewing Committee for Mathematics and Statistics" to broadly survey and assess the standard of teaching and research, facilities available for the purpose; and to recommend steps to be taken (including modifications of syllabuses) in order to raise the general level of academic attainment and research in the Universities.

The committee laid down the following items for more specific study and investigation at its first meeting.

- (a) The present state of development in Mathematics and Statistics.
- (b) A qualitative and quantitative appraisal of the facilities for teaching and research.
- (c) Trends of research, its potentialities and steps to be taken for expansion of training and research facilities in various disciplines of the subject.
- (d) Syllabi and examination system at different levels of University education; improvement and modernisation of syllabi, preparation of model syllabi.
- (e) Ways and means of coordination between institutions including university and non-university centres of teaching and research.

- (f) Improvement of facilities for students and training personnel.

The curricula and courses in Sciences, the Committee noted, failed to evolve at a pace commensurate with the rapid growth of scientific knowledge. After scrutinizing the then syllabi for the under-graduate and post-graduate courses, it prepared the model syllabi—indicating the extent of training desired at each level—keeping in view the following objectives while formulating the B.A./B.Sc. syllabus.

Objectives of B.A./B.Sc. Course

- (a) Training in logical thinking and reasoning.
- (b) Preparing the students for higher studies in Mathematics.
- (c) Equipping the students for the teaching profession.
- (d) Providing the basic training for higher studies in other branches such as physical sciences, social sciences, statistics and technology.
- (e) Fulfilling the needs of society by providing men who can ably pursue professions like Insurance, Accountancy and Computational work.

Model Syllabus for B.A./B.Sc.

In order to meet the above objectives the Committee decided that the B.A./B.Sc. courses should be divided into two categories:

- (a) Topics which shall acquaint the students with basic Mathematical methods. These were:
(1) Algebra (2) Trigonometry (3) Geometry (4) Calculus (5) Differential Equations (6) Mechanics (7) Analysis.
- (b) Topics which develop in the students an idea of rigour and lead to mathematical and logical thinking. This category included the following disciplines:
(1) Numerical Analysis (2) Elements of Modern Algebra (3) Set theory and Foundations of the

Number system (4) (i) Attractions and Potentials and (ii) Elements of Elasticity.

The detailed syllabi covering nearly the above mentioned different disciplines were formulated.

Course Administering Principles

While giving instruction in the above topics, the committee desired that the fundamental principles involved should be stressed and that the instruction in the class room should necessarily be supplemented by tutorials and discussions in small groups of students.

Objective of the M.A./M.Sc. course

The following objectives were decided by the Committee for the formulation of the above course:

- (1) To give training in logical thinking.
- (2) To train students for Advanced Studies in Mathematics leading to research.
- (3) To prepare teachers for schools and colleges.

Model Syllabus

The M.A./M.Sc. course required the training of the B.A./B.Sc. course as formulated by the Committee. It was so framed that by making a suitable choice of the optional group a student could either get introduced to a wide variety of modern topics in Mathematics or receive intensive training in one or two special fields. The syllabi proposed consisted of both full and half courses. Each full course requires 100 hours of lectures and a good number of seminars and discussions. The half course requires about 50 hours. The courses are further grouped into (i) Compulsory papers and (ii) Optional papers. Each student must offer compulsory papers and any two full courses or equivalent full and half courses.

Compulsory Papers:

The first two papers: Theory of functions of a real variable, elementary differential geometry and theory of functions of a complex variable.

Third paper: Differential equations and special functions.

Fourth paper: Potential Theory and Analytical Dynamics.

Fifth paper either: (a) Mechanics of Deformable Bodies

Or

(b) Set Theory and Analytic Topology.

Sixth Paper consisted of either

(a) Electromagnetic Theory and Special Theory of Relativity,

Or

(b) Modern Algebra and Introduction to Algebraic Geometry.

Optional Courses

Optional courses comprised half courses and full courses, as indicated below:

Half Courses

(1) Number Theory I (2) Number Theory II (3) Measure and Integration I (4) Measure and Integration II (5) Functional Analysis I (6) Func-

tional Analysis II (7) Combinatorial Topology (8) Probability Theory (9) Stochastic Processes (10) Information Theory I (11) Information Theory II (12) Feedback Control and Serrromechanisms (13) Mathematical Statistics I (14) Mathematical Statistics II (15) Turbulence.

Full Courses

(1) Algebraic Number Theory (2) Geometry of Numbers (3) Differential Geometry (4) Riemannian Geometry and General Theory of Relativity (5) Set Theory and Point set Topology (6) Modern Algebra and Introduction to Algebraic Geometry (7) Homological Algebra (8) Mathematical Logic (9) Topological Groups (10) Linear Operators in Banach and Hilbert Spaces (11) Integral Equations (12) Fourier series and Allied Services with special reference to convergence and summability aspects, Generalised Functions (13) Theory of Summability (14) Projective, Affine and Metric Geometry (15) Fourier Series, Integral Transforms and Boundary value and Eigen value problems (16) Principles of statistical Mechanics, (17) Principles of Quantum Mechanics (18) Theory of waves and vibrations (19) Non-linear Analysis (20) Boundary Layer Theory and Turbulence (21) Magneto-fluid Mechanics (22) Elasticity (23) Plasticity (24) Compressible Fluid Mechanics (25) Ballistics (26) Internal constitution of stars (27) Stellar Atmospheres (28) Celestial Mechanics (29) Stellar Dynamics.

ACHIEVEMENTS AND REQUIREMENTS

Lack of Publicity: It is gratifying to note that during the last decade many Indian Universities have incorporated to some extent the above suggestions of the "Reviewing Committee", in connection with B.A./B.Sc. and M.A./M.Sc. syllabi. However, at many Indian Universities the syllabi were modified, since the syllabi at the adjoining older Universities were changed. No wonder, such type of modifications of the syllabi have resulted in dilution of the Model syllabi formulated by the Committee. One reason for this state of affairs is the fact that no adequate publicity was given to the report of "Reviewing Committee".

The Development: Although the Committee did not include the disciplines of Set Theory and Statistics among the topics which would acquaint the students with basic mathematical methods, in the actual development these have occupied unique position among the indispensable topics of Mathematics at B.A./B.Sc. level. Not only this, these disciplines have probed deep into the earlier education and today one can notice their elements in the syllabus of Mathematics for students of secondary schools. The reasons for this change are not easy to come by. One reason may be that the concepts of Set Theory are appealing and very simple to introduce, while the discipline of statistics has found wide applicability in the present technological age.

SUGGESTIONS

Fundamental Objectives: The above example clearly demonstrates that at each level of teaching of Mathematics, it is necessary to determine objec-

tively those disciplines of Mathematics, which are fundamental ones. The objective determination should not be based on abstract thinking but should take into consideration the practical data comprising of mathematics employed by the earlier students in their different careers. An element of uncertainty exists here, however it can be ascertained.

Professional Courses: Many professional courses restrict admission to graduates only. Keeping in view their basic requirement in Mathematics for these professional courses, the syllabi at B.A./B.Sc. level should be so formulated that students pursuing these courses after their graduation benefit from it. Here the classification of half courses and full courses, which was suggested by the committee at M.A./M.Sc. level might prove useful.

Utility of Mathematics: It is no denying the fact that however puritan the aim of Mathematics might be, those disciplines of Mathematics have come into limelight and have been rigorously pursued that have found practical applications. With the bold concept of four dimensional universe, visualised by Professor Einstein, Minowski's Geometry was extensively studied.

Only recently the application of Galois Field Theory and Finite Geometry to the problems of construction of designs in the discipline of Statistics, has led many research worker to probe deep into these branches of Mathematics.

Apparently, it is difficult to predict what branches of mathematics will be useful to the future researchers, nevertheless, it is always advantageous if one knows rudimentary elements of all the branches of Mathematics. It is a formidable job to frame syllabus where in all the branches of Mathematics can find their proper places. However, if we could eliminate from the present syllabi the dead, useless, outmoded or unimportant parts of mathematics, howsoever hallowed by tradition they may be, the syllabus can contain the liveliest, most stimulating and distinct branches of Mathematics—mapping it in its entirety.

In brief, it may be noted that there are two principal motivations for formulating syllabi. One is the extraordinary growth of pure mathematics in modern times and the other is the increasing dependence of scientific thought upon mathematical methods, coinciding in time with a more and more urgent social demand for the services of scientists of every description.

Objective of Mathematics Teaching. After carefully examining the objectives of Mathematics Teaching, enunciated by the Committee, it may be further noted that there are evidently broader and equally important objectives which would be served by imbuing the teaching of mathematics with a truly modern spirit and incorporating a few branches of it of fairly recent origin in the syllabi. In fact, the educated man, whom we envisage as the end-product of our elaborate educational system, should not be left behind in mathematics, merely because he is not to be a specialist in mathematics least of all in an era when mathematics is growing so vigorously and penetrating so profoundly into many different domains of thought.

Although, the Committee proclaimed that the first objective of the course in Mathematics is to train the students in logical thinking and reasoning, the teaching of Mathematics has miserably failed in fulfilling this objective. As a result of this, in spite of the fact that the number of graduates is increasing every year, the society around us is full of conflicting and contrasting viewpoints. No wonder even among the mathematic graduates we do not find unanimity of opinions, when a political problem is presented to them, which calls for detached and dispassionate mind.

Success of Teaching: Generally speaking, teaching conveys thoughts about objects rather than living processes of thought. The teacher has not made his pupil independent of him. What is really needed is that the mathematician should convey, not simply the knowledge of how to solve a particular problem, but also the living attitude of mind that would enable his pupil to attack problems successfully without help from anyone. A teacher of mathematics should endeavour to develop this living attitude of mind by inculcating mental-venturesomeness and insight in his pupil.

Principles in Teaching. First of all, there are two fundamental guiding principles with which the above objectives can be achieved. The first is that a mathematical theory can only be developed axiomatically in a fruitful way when the student has already acquired some familiarity with the corresponding material, a familiarity gained by working long enough with it on a kind of experimental, or semi-experimental basis, i.e., with constant appeal to intuition. The other principle is that when logical inference is introduced in some mathematical question, it should always be presented with absolute honesty.

The sound basis for the implementation of the above guiding principles lies in helping the student to understand the bold and enlightening steps of the theory. This can best be achieved by discussing the problem in a small cell of students. However, under the present set-up a majority of students note down what is presented on the black-board. Because of the huge size of the class, it is not possible to give individual attention and carry out discussions in the class. Hence the number of students pursuing University education should be sufficiently curtailed since it is not possible to increase the number of teachers due to paucity of funds.

To create mathematical consciousness and spirited dedication to science of mathematics, every University's Department of Mathematics should encourage its students to establish mathematical clubs, wherein lively and stimulating discussions on Mathematics and Mathematicians take place. In the initial stage, for the formation of Mathematical Clubs the University Grants Commission should take the lead by providing for these clubs, financial support in the form of books, Journals, apparatus and towards travelling allowances of outside speakers. These clubs should be exclusively managed by the students themselves. □

Maulana Azad Library

SYED NAZAR BURNEY

M.A.O. (Mohammedan Anglo Oriental) College established by Sir Syed Khan in 1875 was given the status of university in 1920. The Library of this Muslim institution—Aligarh Muslim University once known as the "Lytton Library" and at present named after Maulana Abul Kalam Azad as the "Maulana Azad Library" is among the oldest university libraries in India.

In 1876, the library was named "Lytton Library" after the then Viceroy and Governor General of India Lord Lytton (who laid the foundation stone of the college in 1877). In 1882, the library received the record of the famous 'Scientific Society' of Aligarh, and thus became a real repository of research

material and manuscripts. The collection was further supplemented by large scale acquisition and donations from eminent scholars, noblemen and teachers from all over the country, namely the 'Habib Ganj Library' (the personal collection of Nawab Sadr Yar Jang) the 'Jawahar Museum' of Etawah (the collection of Khan Bahadur Maulvi Bashiruddin and 'Dr. Ram Babu Saxena Collection', 'Hamid Ali Collection', 'Wali Mohd. Collection' and so on.

SPECIAL CHARACTER

The Maulana Azad Library differs in its contents as well as in the pattern of its services, from most of the other Indian Universities. It serves a residential university which has a distinct educational social and cultural heritage and whose academic traditions, educational requirements and curricular coverage are somewhat different and wider in scope than those of an average Indian University.

And how, like other academic institutions the Library has to cater to the needs of the students, members of the faculties and research scholars. There is a great emphasis on Islamic Studies and literature, Urdu and many Oriental languages and literatures. There are about 5,00,000 printed books and manuscripts in the Library. It is particularly rich in scientific literature of 19th and 20th centuries especially in the Scientific publications of learned societies and of Science journals, Islamic Studies, on Indian medicines and other Sciences, biographical studies and general oriental reference material.

The collection of English books includes literary and historical works published during 17th and 18th centuries. The library's prize possession is the largest and finest collection of Urdu books in the Indo-Pakistan sub-continent and in the world. There are more than forty thousands volumes, many of which are now out of print, covering nearly all aspects of Indian life and culture. Old periodicals and news papers occupy a prominent place and have sets of learned periodicals of the twentieth century as well as a goodly number of rare publications of the early 19th century from the Fort William College, Agra College, Delhi College and from the royal presses of the Courts of Delhi and Oudh. Nearly all the publications in Urdu of the Nawalkishore Press and similar other important presses of India and outside are also available here.

TECHNICAL SERVICES

(a) **Acquisition** : The pattern of library services in the university has been designed on modern lines to suit the present requirements of the academic community of Aligarh. These services are rendered by one Central Library, i.e. Maulana Azad Library and departmental libraries, scattered all over the campus to serve the staff and the students with reading material on the spot. The selection of material is primarily based on the bibliographical sources like book reviews by eminent scholars, trade and subject bibliographies, suggestions received from the readers etc. The specific titles considered to be of vital importance to a certain department of faculty are also recommended for purchase to the heads of the

various departments and the requisite approval is obtained thereof.

(b) **Preparation** : Recommendations of books are called for from the heads of the concerned departments. After the scrutiny of the books ordered with the existing stock the lists of the requisite books are prepared and the formal orders are placed with the approved booksellers.

(c) **Classification** : As soon as the books are received they are passed on to the technical section for the sake of classification. The scheme of Dewey Classification is normally in practice in the library.

(d) **Cataloguing** : After the classification, the books are catalogued. The Classified catalogue is maintained in two parts. One is classified Part and the other is Alphabetical part. Efforts are in progress for preparing a dictionary catalogue also.

(e) **Provision of Access** : Since the "closed Access" system has failed in satisfying the general reader and being very cumbersome and irritating it has become largely obsolete in most of the libraries. However, it is maintained rigidly for the textbooks, rare books and manuscripts etc. in the library. "Open Access" system of book approach is followed for only general and fiction books. Similarly the research reading hall is open for all post-graduate students.

CIRCULATION

Circulation counter is no doubt the place of first and the last contact with the clientele; that the community comes in direct touch with the library staff to get their materials issued. Browne system of Charging and Discharging the books is followed. The number of tickets depends upon the different categories of the readers.

REFERENCE SERVICE

Reference or Personal Service is provided for the readers. A large number of reference books are available on the shelves in the Reference Reading Room which can be consulted without any restriction. Sufficient reference service is devoted for saving the time of readers.

There is a provision of guidance service in the library to facilitate the readers in selecting the books and consulting the reference books which have special mode of arrangements.

ORGANISATION

The Maulana Azad Library covering the total built up area of 71,546 sq ft. surrounded by 4.75 acres of land in the form of gardens, which cost rupees 11 lakhs for building alone, is basically a double storeyed building with 8 floors in its Stack Tower. The building was designed by a famous architect Mr. M. Fayazuddin according to the requirements and the internal arrangements are so flexible that the halls can easily be changed without effecting the basic lay out. In architectural style the building is a synthesis of Islamic and modern functional arts. Facilities for air-conditioning the entire library have been provided in the basic structure.

The technical section, the reading rooms etc. do have enough of space and may cater to the needs of existing and the potential readers.

The research hall of the library has a seating capacity for 200 scholars. It contains an excellent reference and bibliographical collection. There is a separate reading hall for about 350 postgraduate students with facilities for obtaining all the books prescribed or recommended for their curricular studies. The undergraduate Reading Room provides study facilities for 120 students. It provides the basic reading and reference materials for all undergraduate classes. There are separate halls for the study of manuscripts, Urdu research material, Persian and Arabic rare books and for consultation of Audio-Visual materials.

The lighting arrangement in whole of the library is quite satisfactory and the lighting arrangement in the textbook section and research division is soothing to the eyes.

The furniture provided in the Library is entirely comfortable and is in accordance with the ISI Standards. The gangways between the shelves are adequately provided and the readers do not find any difficulty to move in between.

External : Maulana Azad Library is the Central Library of the institution. There are 46 teaching departments having their own libraries under the central library. Nine maintained institutional libraries are also governed by Maulana Azad Library.

SPECIAL COLLECTION

The mostly existing books have been purchased by the library. But the richer collection like Sir Syed-Ahmed Khan collection, Habibur Rahman Khan Sherwani Collection, Hamid Ali Collection, Dr. Ram Babu Saksena Collection, Sabira Yalidi Collection and many other collections were donated by the luminaries and contain valuable manuscripts and rare books.

The Arabic collection, twelve thousand printed books and the thousand manuscripts volumes, is very rich on subjects like Muslim Philosophy, mysticism, Quranic Studies and Hadith Literature, Science and Poetry. A good set of printed reference books is also available here. Among the rare early publications are : "the Qanoon" of Avicenna published from Rome in 1593, "Nizamul Jawahar" of Ibn-e-Batreeq (Oxonia: 1654), "Historia Orientalis" (1600), the "Bible" in Arabic and Latin (Rome 1671) and the "Muradul Latafat" of Ibn Taghri Bardi (Cambridge 1792) etc. Among the Arabic manuscripts, the earliest is a fragment from the holy Quran which is ascribed to the fourth Caliph Hazrat Ali is in the Kufic script written on parchment. A copy of "Nahjul Balagha" of Hazrat Ali written in 538 Hijra is the most valuable Arabic manuscript in the library.

The Persian collection of ten thousand printed books and an equal number of manuscripts, serves as source material for the study of Indian medieval history and provincial local dynasties. □

Round Up

UGC Chief's Plea For Planned Programme

WHILE delivering the Convocation Address at the Osmania University, Dr. George Jacob, UGC Chairman, recalled a remark of HG Wells that human history becomes more and more a race between education and catastrophe. As far as higher education in the country was concerned, he said, "we are on the brink of a catastrophe. Unless the university leadership starts on a planned programme, education is likely to lose in this race between education and catastrophe."

Our democratic institutions have survived but if they have to continue to survive, we have to breathe a new life into them. Our universities have so far stumbled along. If they are to be dynamic centres of light and learning, we have to breathe a new life into them, he added.

Emphasising the role of teachers in the university, he said, that the key note of educational process was a teacher. Learning on the part of students and teaching on the part of teachers must become a social enterprise. It was the function of the university to facilitate this.

Dr. Jacob suggested involvement of colleges that were granted academic autonomy, under the university leadership, in the problems of their respective areas. It

was this involvement, he said, that made our outstanding agricultural universities leaders in the field of agriculture and animal husbandry. The general universities had not been able to have such impact because of their lack of involvement in the problems of the area. The approach of the university to a college wanting autonomy should be positive, he averred, and not negative. Talking about the relative importance of research and teaching he suggested that in a university postgraduate department the teacher should devote three-fourths of his time to teaching and one-fourth to research, his own research and guiding research students.

On behalf of the Students' United Front of Osmania University, a memorandum was submitted to him. The memorandum suggested several measures for improving the educational system. Amongst the suggestions made were: development of a two-tier medium of instruction with English and the regional language providing equal opportunities to both the languages; replacement of the present educational system by a new system of judgement; introduction of the regional language as a medium for entrance tests.

IIM Convocation Address

PROFESSOR NURUL HASAN, Union Minister for Education, while delivering the convocation address at the Indian Institute of Management, Ahmedabad, stressed the urgent need for a distinctive tradition of management education to cater to the needs of both the public and private sectors in a developing nation like ours.

He said that the Government had chosen the public sector to play the leading role in the nation's development so that industrial growth could be tempered with social justice. He admitted that the country was unable to translate many of its economic programmes into performance. In the field of education, he said, many new ideas were propounded but remained on paper.

Sheth Kasturbhai Lalbhai, Chairman of the Board of Governors of the IIM, welcoming the Minister said that it was necessary to regulate admission to the institutions of higher learning and added that with the increased output of management graduates, business and trade would take a more professional look. He appealed to the Minister to use his good offices in providing additional resources for the IIM which had to cut its budget drastically this year.

Sukhadia for Student Participation

WHILE inaugurating the Bangalore University Students' Council, Governor Mohanlal Sukhadia supported the demand for representation of students on university bodies like the university Senate and Syndicate. Tracing the causes of frustration prevailing in the country to the enormous economic problems he said nothing is gained by refusing to recognise our diffi-

culties and efforts should be made to overcome them.

The Chief Minister, Mr. Deva-raj Urs, who presided, welcomed the suggestions of the students' council for adopting a uniform pattern of textbooks and syllabus in the State. He said that there was a multiplicity of textbooks, and they varied even from district to district because we were encouraging the writers of textbooks. It had become a commercial proposition.

Denouncing politics in the universities in the country, Mr. Urs said not only the politicians, but teachers as well were using students for political purposes.



At the seventeenth annual convocation, Dr. Y. Nayudamma delivered the address. Shri Kandubai Kasanji Desai, Chancellor of the University with Dr. D. Jaganatha Reddy, Vice-Chancellor of Sri Venkateswara University and others.

Change Is Indispensable

CHANGE is an indispensable part of progress—without change we have stagnation, said Dr. Y. Nayudamma, Director-General, Council of Scientific and Industrial Research, while delivering the seventeenth Convocation Address of Sri Venkateswara University at Tirupati. Change is usually more acceptable to the young than to the old as they are impatient to make things happen their way. The young are thwarted in their effort to change things by hierarchy and inertia of the system and the hypocrisy and incompetence of the elders. They thus tend to be impatient.

Dr. Nayudamma added that the incidence of unemployment among educated persons has been increasing over the last years. How to accommodate these educated persons all over the country is the problem facing us today. Manpower planning and training are the most crucial areas of

national building. However he added that manpower is not trained in one day or even one year. It is training which one can fruitfully employ ten, twenty or thirty years hence after one has left the university.

So the education is not something which is obtained in a compact form at a part period in life but it is a continuing process. What we need is a new boldness of attitude to the problems of education and employment. Greater flexibility in the educational structure, system, syllabus, with a greater relevance to our present situation and a greater involvement, a sense of participation, adventure and achievement for the student are called for. Our craze for the west and anxiety to catch up with the west, have led us to look to the west for inspiration for solving our problems including the educational problems.

In fact, he said some of us have become foreigners in our own country. John Dewey's educational philosophy is relevant to our present situation, he said and added that his aim was to look at science humanistically and to look at the human situation scientifically. He posed the questions which should be examined in detail and a plan of action should be worked out. Is the education relevant to the present day needs? Are we training the right number in areas where people are required? And, are we training people to be teachers, research workers, for industry or management?

In trying to put any solution one requires certain qualities. The greater the conviction the more would be the faith in one's struggle and this in turn would give rise to other characteristics. If our education has provided us with the traveller's kit containing ambition, aim, ability and action, curiosity, courage and character, you are bound to succeed.

Addressing the students he said success is not destination to be travelled to, it is the journey itself and happiness is found along with it. Education also does not stop on your graduation day. All of life is a time of learning and relearning.

Indian Experts Attend Workshop

Dr. B.S. BHATIA of the Indian Space Research Organization, a government agency, is one of 25 education and technical experts from 10 countries who recently attended an eight-day workshop in the United States to discuss teaching via the new satellite that was launched on May 30 from Cape Canaveral, Florida.

The workshop, sponsored by the U.S. Government's Agency for International Development (AID), served as a forum for exchange of ideas on how satellites can be used to bring classroom teaching inexpensively to children and adults in remote regions where educational opportunities are scarce. The satellite experiment is to be tried first in the U.S. taking education to some of its farflung rural communities and then on a mass scale in India to reach remote villages.

The highlight of the meeting, which began on May 3 at Denver, Colorado, was a visit to Heber, Utah, a town of 3,200, where the local secondary school is scheduled to use classroom exercises via the satellite.

The delegates watched simulated demonstrations of satellite borne educational programmes prepared in tests for a satellite system that is to begin transmissions to schools in the United States this year with one-way colour television and two-way voice channels.

Students will be able to see, ask questions of and receive answers from and hold discussions with the teacher in another city. In India, it will be oneway black-and-white video and one-way voice channels.

Besides India, several nations have already made preparations for satellite education systems some of whom have established an administrative nucleus for such

systems in their ministries of education. Representatives of education ministries were among the workshop participants.

After they return to their homes, the participants are expected to report on the demonstrations and discussions to their government leaders. The reports may help in decisions on continued preparations and on what the contents and other aspects of each nation's satellite educational system would be.

Host and coordinator for the meeting of the satellite education experts was the Federation of Rocky Mountain States, an organization of governments, business,

industry and education units in six states in the mountainous western region of the United States.

The federation will supervise the satellite education system in these states.

The Heber School, which the delegates visited, will use transmissions from the ATS-F satellite (Applications Technology Satellite), which is to be renamed ATS-6 after it attains orbit. It will also transmit educational programmes to schools in the Appalachia region in the eastern United States and to isolated Eskimo and American Indian villages in Alaska.

The films used in the simulated demonstrations for the meetings at the Heber School were made with the ATS-1 satellite which has carried out communications experiments for several years as a forerunner to ATS-F.

Designed to transmit in several languages simultaneously, the satellite will permit viewers in



"Before we change the syllabus we should appoint a committee to discover what our present syllabus is...."

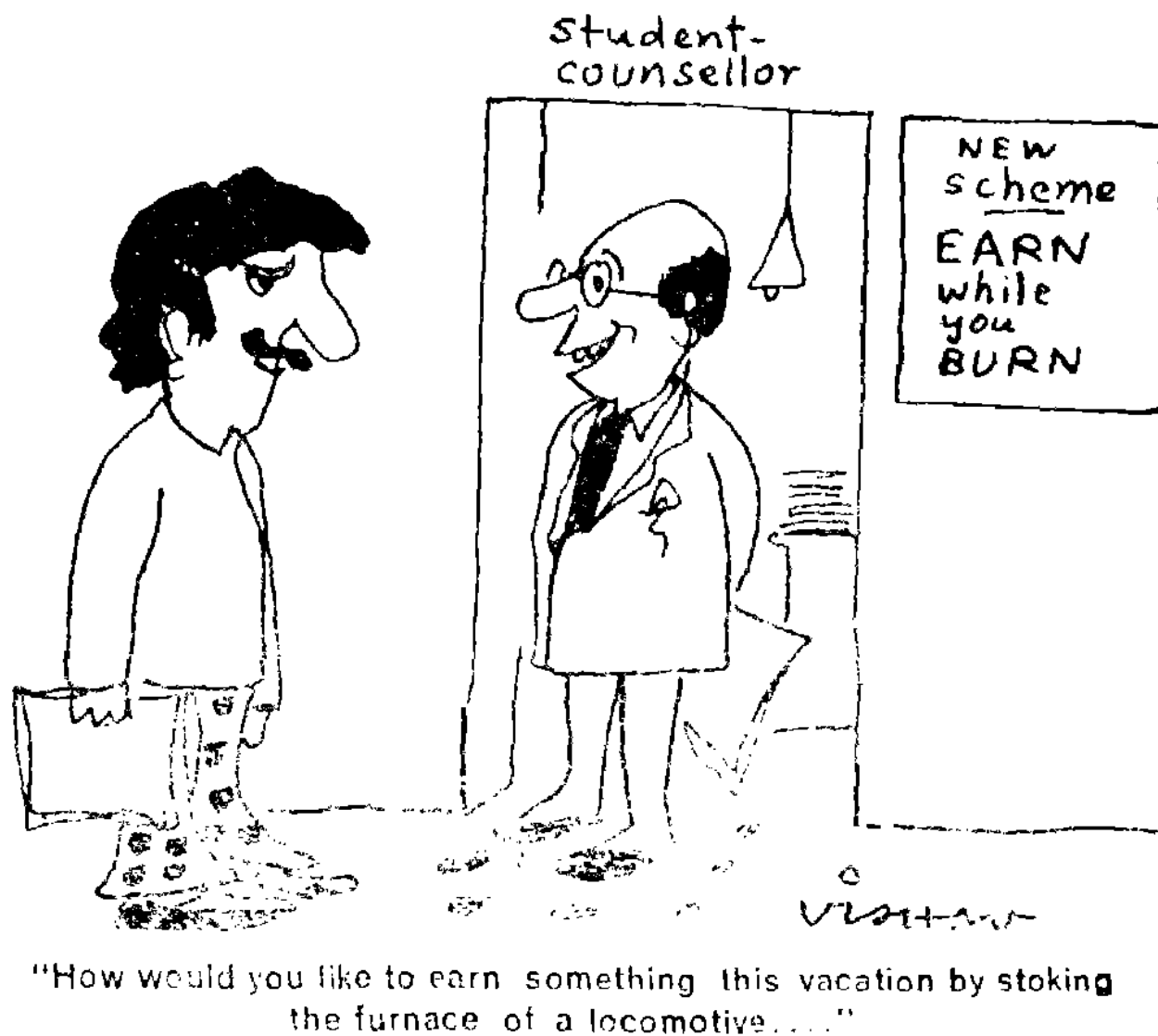
U.S. schools to listen to lessons in English, Spanish, Eskimo or American Indian dialects.

After a year of use within the United States, the satellite's rocket engine will be re-ignited to push the satellite into a new location over eastern Africa from where it can telecast to India.

The satellite will be made available by the United States to the Government of India for a year to beam educational programmes to community television receivers now being installed for that purpose in thousands of Indian villages under a project code named SITE (Satellite Instructional Television Experiment).

India will thus become the first Indian nation to employ a satellite in a systematic education programme for large populations. At the end of the year the results will be analysed to give direction to the future of education by satellite.

Education satellites may eventually provide nearly everyone with ready access to mankind's accumulated knowledge.



Examination Nerves No Handicap

THE thought of examinations often makes students nervous and even the best of them occasionally fail as a result, opponents of the examination system have long claimed.

But their argument can now be discounted, psychologists from Giessen University in Germany have proved that the fear inspired by a forthcoming examination has no influence on its outcome.

Ninety-nine students of five different subjects were covered by the psychologists' survey. They were interviewed two weeks before and immediately after the last of the series of oral examinations they were required to take.

Helmut Zenz and Jorn Scheer describe their findings: "Although two thirds of the students were frightened at the prospect of their

examination and fifty per cent of them thought they would not be able to cope with the situation, no link could be established between their fears and the grades obtained.

The survey, part of research programme into student's psychological problems financed by the Volkswagen Foundation, revealed that students who obtained good grades were just as likely to suffer or not suffer from pre-examination nerves as average candidates.

Another factor that plays no role is the relationship between examiner and examinee. Whether a student likes the examiner, the examiner the student or a student tries to make the examiner like him makes no difference to the final grade.

Two thirds of students are therefore backing the wrong horse

when they consider their relationship to the examiner so decisive that they include this in plans for their examination strategy.

The extent to which psychological and not objective factors sway candidates is partly revealed by their answers to questions before and after their examinations. Before the examination fifty per cent of students thought they were unable to influence proceedings, compared with 26 per cent after the examination.

Fiftyone per cent claimed before the examination that examiners wanted to be fair compared with seventy per cent after the examination.

But one answer remained constant. Asked whether they thought examinations were a suitable means of judging performance, the students tended to give the same reply. Approximately half thought they were while the other half disagreed. There were no don't knows.

Parmar Stresses Need for Dynamic Thinking

Dr. Y. S. Parmar, Chief Minister stressed upon the need for dynamic thinking for the changing society so essential for steering through the difficult times and said objectives in this respect had to be properly defined and that youth must take new responsibilities with courage.

The Chief Minister who was addressing Youth Demands Day organised by the National Students Union of India at Simla said he appreciated the sincerity of the feelings of the youth and the frustration generated out of their uncertain future which was the reason for their uneasiness and shared their concern over it. He said for solution of these, youth should give new directions to their aspirations which should be attuned to the new avenues of potential employment available within the State.

Dr. Parmar said dignity of labour, ensuring maximum use of land through modern science and technology, industrial bias in education and working with own hands could redress the growing malady of uneasiness in the youth. He said that youth should understand that Government jobs were not only source of employment as in developing economy, harnessing of the vast economic potential provided ample opportunities to the youth. He added youth should rise to the occasion in Himachal and it was capable of providing gainful employment to all of them.

He made a strong plea for direct dialogue between the students and the Government for proper understanding of their problems. He said Himachal had earned a name in the country for its peaceful methods to achieve bigger objectives and youth should imbibe in them the spirit to settle their affairs. He added proper direction in job

oriented education would produce quality men and women in the state.

Referring to the demands of the students, he said, Government was fully alive to their genuine difficulties and would try to meet these one by one keeping in view its limitations of finances etc.

Revenue Minister, Shri Des Raj Mahajan said the National Advisory Board had taken a decision to change the educational system. He said vocation oriented education, college education and arrangements for drop-outs had been provided in the new system.

Shri Ramesh Chand Verma, MLA said educational reforms should be with specific purpose to prepare youth for sharing future responsibilities in a befitting manner. He dwelt upon the needs for setting up of youth consultative council in the university.

The student leaders stressed the need for opening new vistas of employment for them after their education, representation of students on the university body and direct link between them and the government.

N. K. Vakil

We regret to announce the sudden demise of Shri Nusserwanji K. Vakil, Vice-Chancellor, Maharaja Sayajirao University of Baroda of heart failure on May 4, 1974. He was a member of the Standing Committee and the Finance Committee of the Association of Indian Universities. He was also the Chairman of the Indian Universities Association for Continuing Education.

Shri Vakil was a former judge of Gujarat High Court and served as the Chairman of the State Advisory Board set up under the Maintenance of Internal Security Act to review the detenus cases. After graduating in Arts from Bombay's Elphinstone College in 1929 and in Law from Bombay Law College two years later, Shri Vakil set up his practice in Surat. He was elected to the bench of Gujarat High Court in 1962. He was the Vice-Chancellor of M.S. University of Baroda since 1970 and had been associated with a number of educational bodies in Surat, Baroda and at national level like the NCERT.

Restricting Higher Education ?

No scheme for restricting higher education as such has been formulated by the Planning Commission, according to the information given in the Lok Sabha by Mr. D.P. Yadav Deputy Education Minister. In fact the Planning Commission, have stated that a direct strategy involving a ceiling

on admissions may not be practicable. The Planning Commission has, however, proposed a strategy which will reduce the rush to Universities while effectively enlarging the scope of receiving higher education if the need is keenly felt. The strategy includes the following components :—

- (a) Vocationalisation of higher secondary education thus enabling large numbers to enter employment at the end of secondary stage;
- (b) Limiting admissions to regular institutions which should conform to certain well-defined standards on the basis of merit while making suitable reservations supported by coaching classes and adjustment courses for the backward classes; and
- (c) Providing the rest of the social demand for higher education through Evening Colleges, Correspondence courses and Private Study.

This strategy is in accordance with the National Policy on Education and provision of Higher Education approved by Parliament and the recommendations of the Central Advisory Board of Education. The programmes of Vocationalisation of higher secondary education through evening classes, correspondence courses and private study has been accepted by Government as part of the Draft Fifth Five Year Plan.

In the Fifth Five Year Plan, the Government proposes to make an intensive effort to reconstruct the educational system in the country so as to make it an instrument of social transformation. The thrust of the Plan is in four main directions:

- (i) Ensuring equality of educational opportunities as part of the overall plan of ensuring social justice;
- (ii) Establishing closer links between the pattern of education on the one hand and the needs of the development and the employment market on the other;
- (iii) Improvement of the quality of education imparted; and
- (iv) involvement of the academic community, including students, in the tasks of social and economic development.

The main features of the Plan are as follows:

- (1) A very high priority to the elementary education and the outlays for it are being stepped up from Rs. 239 crores in the Fourth Plan to Rs.

743 crores in the Fifth Plan. To this may be added Rs 112 crores provided for school feeding programmes under nutrition. The total outlay of Rs. 855 crores, thus arrived at for elementary education, will constitute 47 per cent of the total outlays on education in the Fifth Plan as against 30 per cent in the Fourth Plan.

- (2) At the secondary stage, emphasis is proposed to be laid on proper planning of the location of secondary schools, vocationalisation of the higher secondary stage, adoption of uniform pattern of 10+2+3, and improvement of quality;
- (3) Introduction of work-experience at all stages of education;
- (4) (i) The main strategy for the development of university education will be such as to ensure that, while the social demand for higher education, particularly for satisfying the rising expectations of the newly emerging socio-economic groups, continues to be met, indiscriminate expansion of facilities is not allowed to further dilute the standards of university education. University courses will also need to be restructured so that the students completing their education are enabled to become productive members of society, (ii) Development of post-graduate education and research, and improvement of quality;
- (5) Large scale development of programmes of youth welfare, physical education and games and sports. The Nehru Yuvak Kendras will provide the focus for youth activities especially among non-students. Provision of greater opportunities for service to student youth through National Service Programme;
- (6) To encourage talent and to overcome the environmental handicap of the weaker sections, considerable increased emphasis is being laid on scholarship in diverse fields

including special incentives for education of girls;

- (7) Further consolidation and qualitative improvement of programmes of technical education including expansion and diversification of training facilities for the middle level workers;
- (8) Special emphasis on advanced basic and applied research which *Inter alia* will provide the requisite infrastructure for the national effort in Research and development;
- (9) Development of informal education at all stages. This will include (i) the multiple entry and part time education programmes at the elementary stage (ii) programmes of informal education for youth in the age group of 15-25; (iii) Programmes of informal education at the secondary stage; (iv) the establishment of an open university at the national level and provision of facilities for correspondence education in at least one university in each State and (v) full facilities for private study both at the Secondary and University stages;
- (10) An over-riding emphasis on academic inputs such as revision of curricula, adoption of new methods of teaching, examination reform, improvement of text-books, teacher education -- both pre-service and in-service -- encouragement to experimentation and innovation, use of modern educational technology, including mass media, improved supervision and the development of closer ties between the school and the community;
- (11) A special emphasis on programmes of adult education which will include (i) informal education including liquidation of illiteracy and provision of welfare services for the age group 15-25 and (ii) linking the programme of liquidating adult illiteracy with employment programmes;

- (12) Qualitative improvement of selected institutions at all stages;
- (13) Development of Hindi and Modern Indian languages, Sanskrit and other classical languages;
- (14) Stress on implementation; and
- (15) A greater emphasis on programme of cultural development and their integration with those of education.
- (16) Special programmes of pre-school development.

U.P. Govt. Not to Interfere

A HIGH level meeting at which the Chancellor also participated which reviewed the situation in various universities in the State especially of Lucknow and Allahabad, the U.P. Chief Minister, Mr. H. N. Bahuguna, said that the Government would not interfere with the decisions of the Lucknow University Academic Council about students' demands.

He made it clear that the matter would be entirely left to the Vice-Chancellor who wanted to take a decision on it. But he advised the Allahabad Vice-Chancellor to sympathetically sort out the problems of students including that of attendance.

Mr. Bahuguna indicated that the Government wanted a thorough enquiry into the causes of frequent closure of the universities so that the next academic session might be free from it. Referring to the demand of some students to be allowed to appear for examinations without paying fees, Mr. Bahuguna said that the number was about 150. He had advised the Vice-Chancellor to allow them to appear for the examinations and their cases would be examined later.

Computer Centres Planned

The Electronics Commission accepted, in principle, the proposal that the Regional Computer Centre for the Eastern Region be located at Jadavpur University. It was also decided that the question of sharing the cost between the University Grants Commission and the West Bengal Government may be discussed by the Planning Commission.

It has been proposed that the cost of the Computer estimated at Rs. 100.00 lakhs may be shared among the Department of Electronics (Rs. 65.00 lakhs), U.G.C. (Rs. 17.00 lakhs), and West Bengal Government (Rs. 17.00 lakhs). It has also been decided that the Department may contribute to the extent of Rs. 83 lakhs in the first instance (including the contribution of the West Bengal Government) with the remaining Rs. 17 lakhs coming from U.G.C. The Planning Commission has ap-

proved the inclusion of Rs. 83 lakhs in the Department's Annual Plan for 1974-75. The land and building for the Centre, including air-conditioning facilities, are to be provided by Jadavpur University and the University Grants Commission. The receipts from the Centre will be applied for meeting the recurring expenditure of the Centre, and the deficit, if any, will be met by the U.G.C. and the West Bengal Government. Specifications for the hardware configuration have been finalised, and quotations are being called for.

It is planned to set up three major computer centres at Bombay, Delhi and Bangalore under the UNDP Country Programme. The Centre at Delhi is to be located at Jawaharlal Nehru University New Delhi, and will be a joint venture involving JNU, Department of Electronics and principal user agencies.

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Application form can be had from the Deputy Registrar (Academic), Indian Institute of Technology, Powai, Bombay-400076, by enclosing a self-addressed stamped (35 paise) envelope of size 29x10 cms and superscribed 'Admission to Postgraduate Diploma Course in Industrial Design'. Completed application with I.P.O. of Rs. 5/- must reach the Institute by 30th June 1974.

Central Varsity for A.P.

CHIEF MINISTER. Vengal Rao, after talks with Mrs. Gandhi said that two cardinal points of the six-point formula would be implemented shortly. One of these relate to the setting up of a central university to meet the demands of Andhras in Hyderabad and Secundrabad. It is expected that the Centre will appoint a Special Officer for the University. He will recommend the site for the university and make arrangements for starting it at the earliest.

Over Ambitious Planners Blamed

Mr Kushwant Singh, Editor, *The Illustrated Weekly of India* said that the state of the country was grim. The administration, he said, was on the brink of a collapse.

He was addressing the Teachers' Association of the Punjab Agricultural University at Ludhiana. While the First Five Year Plan succeeded fully, he observed, this was not the case with the second, third and the fourth. The Fifth Plan was a non starter. Fault lay with the over-ambitiousness of the planners.

The Government, he said, should make up its mind on the demands of the various sections of the society and accept those which it wanted to accept. The rest should be turned down firmly and agitations should not be tolerated. Violence should be met with violence, he counselled.

As a nation, Mr. Kushwant Singh said, we were shirkers. There was no other country where people worked less. In education, he said, we have done well quantitatively but not qualitatively.

The Vice-Chancellor, Dr. M. S. Randhawa who was in the

U.N. Varsity Council Appointed

SECRETARY-GENERAL Kurt Waldheim and the Director-General of the United Nations Educational, Scientific and Cultural Organisation (UNESCO), Rene Maheu, have announced the appointment of a 24-member Council of the United Nations University.

Mr. G. Parthasarathi, Vice-Chancellor, Jawaharlal Nehru University, New Delhi, has been chosen as one of the members of the Governing Council for the United Nations University. This was announced by Dr. Kurt Waldheim, Secretary-General and the Director of UNESCO. The head-quarters unit of the University, called the U.N. University Centre, will be located in Tokyo and it is expected to begin its operations in October this year. The university will be a world-wide network of research and training centres and associated institutes.

The Council, which is the governing board of the United Nations University, is appointed jointly by the Secretary-General and the Director-General of UNESCO, in consultation with the agencies and the programmes concerned, including United Nations Institute for Training and Research (UNITAR). The

chair said that the situation was not as gloomy as had been painted. If India controlled its population and ensured agricultural inputs, it could still pull itself out of its difficulties. While people talked of success achieved by foreign countries nobody bothered to take notice of the remarkable work done by the farmers of the Punjab.

Council is established on a broad geographical basis, with due regard to major academic, scientific, educational and cultural trends in the world, taking into account the various fields of study.

The Secretary-General and the Director-General of UNESCO and the Executive Director of UNITAR will be *ex officio* members of the Council. The Rector, who is the chief academic and administrative officer of the University, is expected to be appointed by the summer of 1974. He will also be a member of the University Council.

The Charter of the United Nations University was adopted by the United Nations General Assembly on 6 December 1973.

The United Nations University besides being a world-wide network of research and training centres and associated institutions and activities will emphasize action-oriented research into "the pressing global problems of human survival, development and welfare" and the post-graduate training of young scholars and research workers.

Information Bureau Opened

THE Madras University Students Information Bureau has started its Information Gallery and Youth Meet Experience from the middle of last month. The Gallery is open till June 16, 1974 and furnishes information and guidance to students so as to help them choose their future courses of study and career.

A.P. Steps for Comprehensive Education Bill

The Andhra Pradesh Government has constituted a 30-member Committee headed by Shri M. V. Rajagopal, IAS, Secretary to Government, Panchayati Raj Department to go into the following matters and make a report to the State Government.

(1) Recasting the draft of the comprehensive Education Bill so as to incorporate the major recommendations of the Seminar on the Bill and also to make it as comprehensive as possible, keeping in view the dynamics of educational change both inside the State and the country and also, to the extent relevant, the major trends in the world at large.

(2) The recommendations of the Seminar in regard to pre-primary and primary education, secondary education, intermediate

and collegiate education and other areas covered by the Seminar in its various groups.

(3) To suggest such amendments as are necessary and urgent to the existing University Acts and the Board of Intermediate Education Act in the State.

The State Level Seminar on Education convened by the AP Government (March 15, to 17, 1974) considered many aspects of Education in the State and made a series of recommendations. The deliberations of the Seminar included a discussion in particular, of the draft comprehensive Education Bill which is due for submission to the State Legislature. The State Government is of the view that the recommendations of the Seminar should be carefully studied by a broad-based Committee represen-

ting educationists, legislators, administrators, students, aided managements and others concerned.

Among others the Committee consists of Sri Dilsukhram, IAS, Secretary to Government Education Department, Shri L. Bullayya, Vice-Chancellor, Andhra University, Sri N. Narothom Reddy, Vice-Chancellor, Osmania University, Dr. Jaganatha Reddy, Vice-Chancellor, Sri Venkateswara University, Sri M. R. Pai, IAS, Vice-Chancellor, A.P. Agricultural University, Sri T. R. Doss, Vice-Chancellor, Jawaharlal Nehru Technological University, Sri K. V. Gopalswamy, MA (Oxon), Bar-at-Law, former Registrar, Andhra University, Hyderabad, Dr. G. S. Melkote, M.P., Hyderabad, representatives of State Students Unions, and others.



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Bacterial Culture As A Farm Input

Dr. S.N. Saxena, Professor and Head of the Department of Soil Science, Udaipur University, has worked out a plan for supplying the nitrogen-fixing "Bacteria culture" to the farmers so that they can make nitrogen available to crop plants despite short supplies of fertilizers.

Bacteria "Rhizobium" contributes to the nitrogen deposits of the soil giving spectacular increase in pulse yields. They inhabit root nodules for leguminous plants and any increase or decrease in their population would affect the amount of nitrogen deposited in soil and consequently the crop yields accordingly. To cope with the shortage of nitrogen fertilizers there has to be greater emphasis on pulse cultivation. Accordingly the university has undertaken an intensive programme of popularizing the use of bacteria-culture to make good the deficiency of nitrogenous fertilizers. Culture packets of 250 gms each are made available to the farmers at nominal cost of Rs. 2/- each. One packet is sufficient for an acre of land and

would normally fix 30 to 60 kg. nitrogen in that area.

Dr. Saxena has found out that Rhizobium inoculation doubles the yields of new legumes like soybean and berseem since most of our soils are deficient in the particular bacteria capable of nodulating on them. Even the yield of traditional legumes like gram, masur, etc., is appreciably increased by bacteria culture.

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PERSONAL

1. Dr. B.D. Nag Chaudhuri would be taking over as the Vice-Chancellor of Jawaharlal Nehru University w.e.f. July 1974.

2. Prof. R.C. Paul has been appointed Vice-Chancellor of Panjab University w.e.f. July 1974.

CURRENT DOCUMENTATION IN EDUCATION

A list of select articles culled from Periodicals received in AIU Library during April-May 1974.

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Padmanabhan, C.B. "Some problems in Indian educational planning". *University News* 12 (3); Mar 74: 5-6.

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Morgan, George. "New lease of learning for the over 60's". *Times Higher Education Supplement* (125); 8 Mar 74:9.

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Council of Graduate Schools in the United States. "Scholarship for society: Report on graduate education". *Chronicle of Higher Education* 8 (11); 3 Dec 73: 7-14.

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Griffith, Raymond. "Panjab Agricultural University: A variety with Soul". *University News* 12 (4); Apr 74:10-11.

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Mathematics

1. Garai, Ranjan Kumar. Certain investigations in Reimannian geometry. University of Burdwan.
2. Harinder Singh. On some problems of thermoelasticity and generalised thermoelasticity. Punjabi University.
3. Khade, Vijay Kumar Dnyandeo. Studies in groups of motions and collineations in general relativity. Shivaji University.
4. Manna, Nemai Chandra. Certain Investigations in dini derivatives of real functions. University of Burdwan.
5. Sarin, Vijay Bhushan. Fluid flow through pipes and heat transfer effects. University of Delhi.

Physics

1. Choudhary, Samir Roy. A study of nuclear reactions. Ravishankar University.
2. Krishnamurty, R. Surface structural and microhardness studies of crystals. Jabalpur University.
3. Lanka Hari Hara Prasad. Luminescence spectra of heavily doped KCl: TIP phosphors. M.S. University of Baroda.
4. Premachand, K. K-Shell photo electric cross sections of low energy photons in light elements. Andhra University.
5. Rode, Nishit. Magnetic, electric and X-ray study of SrS: (Mn, Zr) Phosphors. Jiwaji University.
6. Sharma, Ram Gopal. Electrical and thermal conductivities of dilute magnetic alloys at low temperatures. University of Delhi.
7. Sobhana, S. Propagation of neutron waves in crystalline and non-crystalline assemblies. Indian Institute of Technology, Delhi.
8. Srinivasan, R. Conformational studies of random polypeptides. Madras University.
9. Taank, Jai Kishan Singh. Applications of weak interactions to stellar energy loss rate calculations. University of Delhi.
10. Talukdar, Amarendra Nath. The crystal and molecular structure and pyridine picorate with special reference to the use of optical transform methods. University of Gauhati.
11. Venkataratnam, S. Nuclear spectroscopic Investigations on isotopes Ce 143, Se 81, and Ge 75. Andhra University.

Chemistry

1. Bhaskar, Vijaykumar Narayan. Studies related to α -keto acids. Vikram University.
2. Bora, Mohendra Nath. A study on the thermal behaviour of some polycrystalline inorganic complexes by X-ray diffraction and physical method. University of Gauhati.
3. Desai, Dineshchandra Harikisandas. Thermal behaviour of amylose and its derivatives. Sardar Patel University.
4. Gupta, Sadashiv. Transitional metal complexes of anti-malarials. Vikram University.
5. Jain, Partha Ram. Ion exchange studies on some less familiar metal ions in aqueous methanol medium. Awadhesh Pratap Singh University.
6. Jaiswal, Ram Prasad. Studies on hydroxamic acids. Ravishankar University.

7. Patki, Bhalechandra Ambadas. X-ray spectroscopic study of some binary (intermetallic) compounds. Nagpur University.

8. Puri, Sukhbir. Photodecomposition and photooxidation of diphenylamine. Punjabi University.

9. Pushpinder Singh. Studies in conjugated Schiff bases. Punjabi University.

10. Ramarajam, V.M. Sadagopa. Studies in chromic acid oxidation. University of Madras.

11. Saxena, Awadh Kishore. Kinetics of oxidation of citric tartaric acid and acid by water decomposition product of blue perchromate. Awadhesh Pratap Singh, University.

12. Swaminathan, C.S. Studies in the chemistry of natural products. University of Madras.

Earth Sciences

1. Appanagoudar, S.M. Granite Syenite and associated rocks of Koppal Area, Raichur District, Mysore State. — Karnatak University.
2. Roy, Bhaskar. Pattern and causes of inundation of the Rann of Kutch. M.S. University of Baroda.
3. Satyanarayana, K. Studies on some aspects of the modern deltaic sediments of the Mahanadi River, India. Andhra University.

Engineering & Technology

1. Deshpande, Mohan Umakant. Application of asynchronous pulsed sequential circuits for power system protection. Nagpur University.
2. Choube, Om Prakash Madanlal. An analysis of spherical grids. Nagpur University.
3. Kannappan, R. Hydrodynamics and mass transport in rotary disk contractors. University of Madras.
4. Sahai, T.P. A study on the nature of the so-called blue peroxychromic acid. Jabalpur University.
5. Mukhopadhyay, Apurba Kumar. Cumulative changes in mechanical properties of metals under low cycle fatigue. Indian Institute of Technology, Delhi.
6. Hardas, Arun Murlidhar. Stress distribution in cams and other profiled plates. Indian Institute of Technology, Delhi.
7. Sinha, Dharendra N.N. Contribution to the analysis and design of linear and parametric amplifiers. Indian Institute of Technology, Delhi.
8. Sastri, Kompella Subbaya. Shift register sequences and their use in system identification by crosscorrelation. M.S. University of Baroda.
9. Thakkar, Kiritkumar Keshavlal. Developments in static relays for transmission line protection. M.S. University of Baroda.
10. Balakrishna Rao, K. Heat transfer in mechanically agitated gasliquid systems. Andhra University.

BIOLOGICAL SCIENCES

Biochemistry

1. Shah, Dinesh Ghanshyamdas. Nutritional studies on pre-school children. M.S. University of Baroda.

Botany

1. Chandani, M. Some aspects of cytology and cytology of the medicinal plants of Sahyadri ranges. Karnatak University.
2. Ingle, S.R. Further studies of the intertrappean chert flora of the Deccan. Jabalpur University.
3. Karatela, Y.Y. A contribution to the floristics and phytosociology of the Chhotaudepur forest division in Gujarat State. Sardar Patel University.
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6. Naik, Mukund Lal. Ecological studies of some grasslands of Ambikapur. Ravishankar University.
7. Ummachchan, M. The flora of Bhopal (Angiosperms). Vikram University.
8. Vyas, Kantilal Jethulal. A contribution of the floristics and phytosociology of river Narmada in Gujarat State. Sardar Patel University.

Zoology

1. Bharmra, Harijinder Singh. Changes in the haemocytes and lipid concentration of haemolymph in relation to gonadal and endocrine cycles in *Gryllus bimaculatus* Degeer. Vikram University.
2. Des, Balkrishna Bapanna. A morphological study of the polymorphic forms of the termite. Nagpur University.
3. Jogelkar, Asha. A systematic revision of the fishes of family soleidae. Vikram University.
4. Keshavan, R. Studies on colour changes in the Prawn *Macrobrachium kistensis*. Marathwada University.
5. Nagarajan, K. Studies on the gutlining of some arthropods. University of Madras.
6. Sinha, Krishan Mohan. Studies on taxonomy, bionomics and anatomy of a cava-gryllid. Ravishankar University.
7. Tembhare, Dnyaneshwar Bapuji. Studies on the neuro-endocrine system in the Dragonfly, *Orthetrum chrysus* (Salys) (Libellulidae: Odonata). Nagpur University.
8. Yadukulan, S. Comparative studies on the chemical nature of the hepatopancreas, the haemolymph and their role in the formation of cuticle in some arthropods. University of Madras.

Agriculture

1. Badiger, M.K. Studies on some factors influencing zinc nutrition in hybrid maize (*Zea Mays* L.) grown in solution culture. University of Agricultural Sciences, Bangalore.
2. Chhatpar, Hari Shewaram. Some problems of post-harvest physiology in Mango. M.S. University of Baroda.
3. Dutta, Abhijit Kumar. Effect of certain mineral nutrients (N, P, Ca) on growth yield, nodulation and nitrogen fixation capacity of certain pulse crops. University of Gauhati.
4. Gurdial Singh. Physiological changes in grape seeds during their maturation, dormancy and germination. Punjab Agricultural University.
5. Padmanabhaiah, D.R. Studies on the influence of some plant growth regulants on certain morphological, physiological and biochemical changes in the developing grape berry. Tamil Nadu Agricultural University.
6. Raman, K.R. Studies in Jasmine with particular reference to flowering. Tamil Nadu Agricultural University.

7. Rastogi, Surendra Kumar. A comparison of analytical methods for soil zinc. Jawaharlal Nehru Krishi Vishwa-vidyalaya.

Veterinary Science

1. Panchmukhi, B.G. Pre-natal development of the Buffalo (*Babulus bubalis*) stomach with particular reference to organogenesis and histogenesis. Gujarat Agricultural University.

SOCIAL SCIENCES

Sociology

1. Deshmande, Gopal Martand. A sociological study of intellectuals in Vidarbha. Nagpur University.
2. Joshi, Hemlata P. Social life of Hindu women after divorce in Bombay. S.N.D.T. Women's University.
3. Kashalikar, Madhav Janardan. Social life as depicted in Jainkavya literature. Shivaji University.
4. Khara, P.D. Sociology of child development among Punjabi Muslims. University of Delhi.
5. Mishra, Roop Narayan. Socio-economic structure of Abujh Marhas. Ravishankar University.

Political Science

1. Hazarika, Niru. Assam Public Service Commission. University of Gauhati.
2. Jolly, Nany. Parliament and India's China policy 1950-1964. Jawaharlal Nehru University.
3. Vaidyanathan, N. International Labour Organisation conventions and their influence on labour legislation and practices in India. Jawaharlal Nehru University.

Economics

1. Niranjana Rao, G. Changing conditions and growth of agricultural economy in the Krishna and Godavari Districts 1840-1890. Andhra University.
2. Sarma, Kailash Chandra. Rural credit in Assam: A case study of Nulbari Subdivision. University of Gauhati.
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Education

1. Gajjar, Jagdishchandra Joitaram. A critical study of M.S. University community towards students personnel services. M.S. University of Baroda.
2. Goyal, Rajinder Pal. A study of some personality correlates of creativity in secondary school teachers under training. Punjabi University.
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6. Mankad, S.D. Planning the objectives for the teaching of Gujarati in secondary schools of Gujarat and the construction of objectives based curriculum for Std. X. Saurashtra University.

7. Mitra, Kamal Rani. Evolving a method of teaching English as a second language for higher secondary classes in Delhi schools. University of Delhi.

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Commerce

1. Gulhane, Pundlik Krishnarao. Distribution of foodgrains in Maharashtra State. Nagpur University.

2. Soni, Ramdayal Girdharilal. The problems and processes of the development of consumer's cooperation in Vidarbha. Nagpur University.

Management

1. Kalra, S.K. A study of high achievers in an industrial organisation: A study in a nationalised Bank. Tata Institute of Social Sciences, Bombay.

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3. Ramamurthy, L. Impact of changing work technology on the manager in industry. Tata Institute of Social Sciences, Bombay.

HUMANITIES

Philosophy

1. Pandey, Ghanshyam. A critical examination of the principles of logical positivism. Awadhesh Pratap Singh University.

Literature

English

1. Lakshmana Rao, D. The quest for identity in the fiction of Bernard Malamud. Andhra University.

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1. Acharya, S.M. A critical study of Geet Gauripati by Bhanudatta with editing of the same. Saurashtra University.

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Marathi

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2. Jog, Vijay Sakharam. Samyavadacha adunika Marathi vyanagnyateel parinam. Nagpur University.

3. Mandvakar, Sindhu. Balkrishnan yachya sahityache mulyapan. Vikram University.

4. Savarkar, Subhas Damodar. Astitvad va Marathi kadambri. Vikram University.

Telugu

1. Hanumantha Rao, P. Mahakavi Dhurjati's poetry and personality. Andhra University.

Kannada

1. Umadevi, M.R. Kavi Chakravarti Poona Nattu atana kritigalu. Karnatak University.

History

1. Gardarshan, Singh. The character and impact of Singh Sabha movement. Punjabi University.

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3. Mukheria, Pratap Singh. The internal administration of India under Lord Auckland, 1836-42. Awadhesh Pratap Singh University.

4. Mukhopadhyay, Gouri Sankar. The Mughal and the British, 1895-1837. University of Burwan.

5. Prasannaalakshmi, M.J. The position of women in Tamil Nad from Sangam age to 9th century A.D. University of Madras.

6. Ram Siya Singh. Baghel-British sambandh, 1858-1948. Awadhesh Pratap Singh University.

7. Vikram Jit Singh. Military campaigns of Anglo-Mysore Wars I and II. University of Delhi.

8. Walia, Urmilla. Relations of the Government of India with the Indian states, 1823-35. University of Delhi.

Geography

1. Panda, Banmali Prasad, Chhattisgarh Basin: A study in agricultural land use. Jiwaji University.

2. Shukla, Hira Lal. A word geography of Bhaghelkhand. Ravishankar University.

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Minimum Qualifications

Candidates with a Bachelor's degree or equivalent as recognised by the All-India Council for Technical Education in the appropriate branch of Engineering (Aeronautical, Chemical, Civil, Electrical, Electronics, Telecommunication, Mechanical and Metallurgical) with a minimum Cumulative Performance Index of 5.5. or with at least 55 per cent of marks in the qualifying examination are eligible for seeking admission. Graduates in Civil, Electrical and Mechanical Engineering are also eligible for admission to the Aeronautical Engineering branch. Some of the electives in the Mechanical Engineering branch are also open for graduates in Aeronautical and Metallurgical Engineering. Some of the electives in the Metallurgical Engineering branch are also open to graduates in Chemical and Mechanical Engineering.

Candidates with a Master's degree in Physics with Wireless/Electronics/Radio Physics, as special subject(s) are also considered for admission to some of the elective groups in Electrical Engineering, provided they have passed the qualifying examination with at least 60 per cent of marks.

CANDIDATES BELONGING TO SCHEDULED CASTE/TRIBE WILL BE CONSIDERED FOR ADMISSION PROVIDED THEY HAVE OBTAINED ATLEAST 50% OF MARKS AT THE QUALIFYING EXAMINATION. SPECIAL CONSIDERATION WILL BE SHOWN TO THEM IN MATTERS OF ADMISSION. THEY ARE ALSO EXEMPTED FROM PAYMENT OF TUITION FEES.

Candidates who have appeared at the corresponding qualifying examination and are awaiting results are also eligible to apply.

Information brochure and application forms: Information brochure giving detailed information records electives offered etc. and application forms can be had from the Deputy Registrar (Academic) by enclosing a self-addressed stamped (60 paise) envelope of size 23 x 18 cm and superscribed 'Admission M. Tech. course in ... (Mention here branch of Engineering). Completed applications with Indian Postal Order for Rs. 5/- must reach the Deputy Registrar (Academic) by 15th June 1974.

Postal requests for application form, received without a self-addressed, adequately stamped and duly superscribed envelope of the appropriate size, or received after 7th June 1974 will not be entertained.

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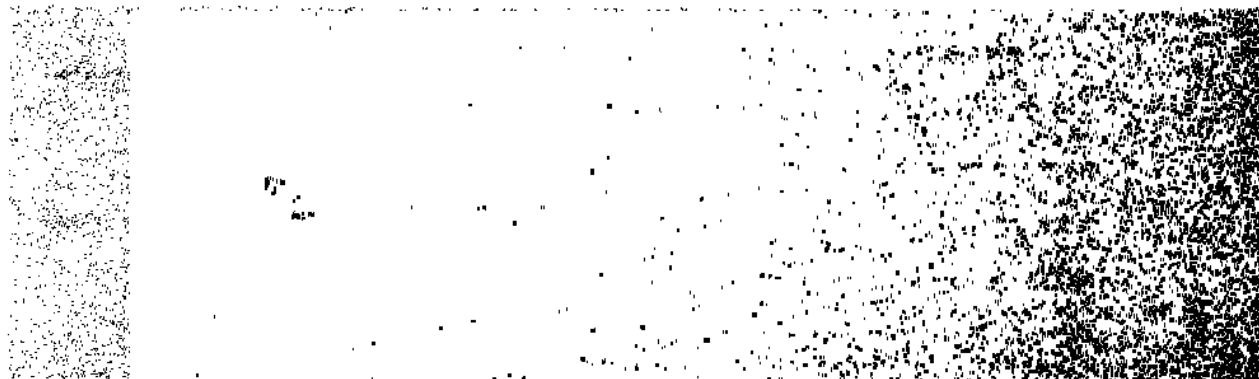
July 1974

Re. 1.25

**Declining
Ethics of
Exams**

**The U.N.
Varsity**

**Age and
Evolution**



**Players
and
Coaches**



INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY
P.O. I.I.T., POWAI, BOMBAY-76

ADVERTISEMENT NO. 778/74

APPLICATIONS are invited for the following permanent posts in the Institute Library.

(i) Librarian: Scale of Pay: Rs. 1100-50-1300-60-1600.

(ii) Dy. Librarian: Scale of Pay: Rs. 700-50-1250.

Allowances: D.A., H.R.A., C.A. etc. admissible as per rules of the Institute.

The Institute Library has a large collection of books and it subscribes to a number of national and international journals. In addition, it has an exhaustive collection of back volumes of these journals. The Library is one of the vital facilities catering to the needs of faculty in their teaching and research. The Institute is expected to acquire shortly Xero-graphic facilities and other visual aids. Thus, the posts of Librarian and Deputy Librarian offer a challenge to persons with imagination who are prepared to organise a first rate library.

QUALIFICATIONS:

(i) Librarian:

A Scholar of high academic standing preferably with a Ph.D. degree in Library Science having previous experience and deep interest in guiding the work of a University level Library. The incumbent is expected to be in constant touch and dialogue with the faculty. Should possess personality, calibre and ideas in the management of the Library conducive to the academic growth of the Institute. Knowledge of foreign languages desirable.

(ii) Deputy Librarian:

Preferably First Class Master's degree in Science/Engineering/Technology and Preferably Master's degree in Library Science with 5 years' experience in a responsible position in a University level Library. Should be well conversant with the day to day working of the Library and should have keen interest in Library Management such as proper cataloguing, preparation of scientific and technical bibliographies, Library budget etc. Should be able to help students with reference and research materials.

Candidates who do not possess the formal qualification in the Library Science but have outstanding educational background and wish to take the assignment as a Career will also be considered. Selected candidates will be encouraged by facilities being provided to improve competence in the area of Library Science.

Applications from persons in India

should be made on the prescribed form obtainable free of charge from the Registrar of the Institute by sending a self-addressed envelope of 25cm x 10cm size.

Applicants from abroad may apply on plain paper (Two copies).

Candidates employed in Government/ Semi-Government Organisations or Educational Institutions must apply through proper channel.

Completed applications should reach the Registrar, Indian Institute of Technology, P.O.I.I.T., Powai, Bombay-400076 by 5.8.74.

INDIAN INSTITUTE OF TECHNOLOGY KANPUR IIT POST OFFICE KANPUR

ADVERTISEMENT NO. 13/74

APPLICATIONS are invited for the post of an Aircraft Maintenance Engineer in the Flight Laboratory of the Department of Aeronautical Engineering, IIT Kanpur. Depending upon the qualifications and experience, the selected candidate may be offered one of the following positions:—

*Aircraft Maintenance Engineer (Junior Scale):

Pay scale: Rs. 700-40-950-50-1200

*Aircraft Maintenance Engineer (Senior Scale):

Pay scale: Rs. 1250-60-1550

*Subject to revision on the basis of third pay commission report.

The Flight Laboratory of IIT Kanpur is engaged in educational, development and research programmes in aerodynamics and flight mechanics. It also imparts instruction in gliding through the Gliding & Soaring Centre.

The Laboratory has a well equipped hanger, and a 3,000 ft. runway from which it operates the following aircraft:

Airplanes:

(1) Cessna 182H fitted with Continental—O-470 engine

(2) Piper PA-18 fitted with Lycoming—O-370 engine.

(3) Kanpur-II fitted with Lycoming—O-540 engine.

Glders:

(1) Rohini.

(2) ITG-3.

(3) Kartik KS-II

(4) Schweizer 1-26.

(5) Schweizer 2-22.

Presently, the laboratory has a complement of a dozen aircraft maintenance crew.

Job Description:

The aircraft maintenance engineer will be responsible for providing total engineering support required for carrying out the programmes of the Flight Laboratory. His duties include:

(i) Maintenance and overhaul of the airplanes and gliders and of all equipment and facilities of the laboratory.

(ii) Carrying out necessary modifications on the aircraft as and when required for conducting tests and experiments.

(iii) Procurement and storage of aircraft spares, tools, equipment and materials.

Qualifications & Experience:

The applicant must have the necessary Aircraft and Glider Maintenance Engineer's Licence (Cat. A, B, C and X). Persons with an engineering degree and/or licence in Cat. D will be preferred. He must have a minimum of 5 years' experience as an aircraft maintenance engineer to be considered for the post in Junior Scale and of 10 years for post in Senior scale. Persons who have retired from active duty may also apply. Such candidates may be offered ad hoc appointment for one year or more.

Other things being equal preference will be given to Scheduled Caste/Tribe candidates.

The post is permanent and carry retirement benefit in the shape of C.P.F. cum-Gratuity Scheme or G.P.F.-cum-Pension-cum-Gratuity Scheme.

The age of retirement is sixty years. Besides pay, posts carry allowances according to the Institute Rules, which at present correspond to those admissible to Central Government employees stationed at Kanpur. Higher initial pay is admissible to specially qualified and deserving candidates called for interview. The candidates will be paid second class fare from the place of duty to Kanpur and back by the shortest route.

Applications should be made on the prescribed forms obtainable free of charge from the Registrar of the Institute by sending self-addressed unstamped envelope of 25 cms. x 10 cms. size. Applications should be accompanied by a postal order for Rs. 7.50 (1.87 p. for schedule castes /tribe candidates).

All applications should reach the Registrar, Indian Institute of Technology, IIT Post Office, Kanpur 208016 latest by August 16, 1974.

UNIVERSITY NEWS

Vol. XII
No. 7



JULY
1974

A Monthly Chronicle of Higher Education

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Editor : ANJNI KUMAR

Declining Ethics of Examinations

H. S. Singha

ETHICS of a system is very vital to its successful functioning because public faith and acceptability hinges mostly on it. A system has not only to be fair but should also appear to be fair. It is the declining ethics of the examination system that seems to threaten it more than anything else. Cheating in examination appears to have become a social and educational phenomenon of sizable dimensions. So pernicious is its effect that it can prove baneful not only for examination system but for the education system itself. It makes examinations technically worthless, reduces learning to a frustrating experience and can also prove socially disastrous. As a consequence of unfair means the examination marks which are supposed to be indicators of scholastic achievement become meaningless entities. The difference between students getting 40 and 50 marks may not be due to the difference in their inherent ability or understanding of the subject matter but may simply be due to their ingenuity and resourcefulness in beating the examination system. The extraneous factors introduced by unfair means invalidate the whole process of testing. Not only this, unfair means have a serious backwash effect on the process of teaching and learning in the universities. Examinations are recognized as a strong mobilizing force in education. They provide a strong stimulus to educational effort affecting teachers, students and even the universities. This motivating force vanishes when there is an impression that examinations would not be conducted fairly or honestly. Furthermore, unfair means in examinations do not cripple only the education system but also destroy the very democratic fabric of our society. As a consequence of malpractices, the distinction between competence and in-competence becomes more difficult to discern and the principles of equality of opportunity and social justice which are essential ingredients of democracy, as we understand it, are observed only in their violation. If unfair means in examinations do really exist they will bring about all-round inefficiency and wastage by putting people in positions by virtue of wrong labels they get through dubious means.

The above mentioned serious consequences justifiably make unfair means in examinations a serious matter of deep public concern. Every year during examination days we are haunted by the abominable monster of unfair means. It comes in the guise of materials hidden in students' persons, smuggling of

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answer books in and out of the examination hall, outright dictation of answers on loud-speakers, attacks on invigilators and umpteen other forms. As cheating in examinations is essentially the illegitimate child of the education system and the under-developed economy born in a decadent society, it is natural that there should be some hush-hush and consequent exaggeration about it. That is why the Association of Indian Universities took up recently a survey of unfair means in under-graduate examinations for the academic year 1972-73 just to size up the issue. This paper reports part of the findings of that survey, particularly those dealing with the extent of unfair means during the conduct of university examinations.

The question of measurement of the size of unfair means is a highly complex affair. Even if there appears to be no semantic confusion, real meaning of unfair means may be elusive, rest as it does on the thin edge of social acceptability. The ultimate aim of candidates who sit for the examinations is to secure marks as high as possible. Only when the means adopted for the purpose deviate from accepted social norms, they become unfair. The difference between fair and unfair is really as tenuous as between honest and dishonest behaviour. Take for example the case of guessing the expected questions for examinations and resorting to selective or eliminative study. This recognized way of preparing for the present examinations is seldom questioned. Similarly, if a student presents a point of view in his answer just to impress the examiner, regardless of his own convictions, he would possibly pass the test of social acceptability. So is the case with students writing around the topic when not sure of the answer. These subtle ways would rather go under the respectable rubric of 'test-wiseness'. To avoid these difficulties, we simply take examinations to be a game and if it is played according to rules it is played well. So unfair means for the purposes of the present study would imply the organized or unorganized defiance of university rules in the process of taking university examinations. There is also another difficulty connected with the measurement of the size of cheating in examinations. It concerns under-reportage of the cases of unfair means. The study considers only the number of cases reported to the universities. This is certainly a limitation of the study. Furthermore, there could be unfair means before the examination, during the examination and after the examination. In this paper we shall be concerned only with the incidence of unfair means during the actual conduct of examinations, and that too mainly with the problems of extent of incidence. No attempt is made to prove or disprove hypothesis. What emerges is a set of observations which could further generate hypotheses.

The conduct of examinations represents the climax of the process of testing in the universities. It is here that the interaction between the students and the system of examinations become maximum. It is natural therefore to expect maximum incidence at this stage only. This has been more than proved by the survey conducted by the A.I.U.

The fact that malpractices in university examinations is a national problem is also amply proved, if a proof is at all required, by Table I read with the proviso that the figures in this table refer only to the reported cases. Table I gives the extent of unfair means during the actual conduct of examinations in the mainstream universities. Column 4 of the table gives the index as the number of unfair means cases reported per thousand students registered with the university for examinations. The index varies from 0.69 to 48.04. There is no university completely free from cheating during the examinations. The national index of unfair means for the mainstream universities as the number of cases reported per thousand students who sit for the examinations comes to 11.27 which is certainly not a gratifying figure. This implies that for every about 89 students who were registered for undergraduate

TABLE I

Extent of reported unfair means (UFM) cases in undergraduate examinations held during 1972-73 in the mainstream Universities

S. No.	University	No. of students registered	No. of UFM cases reported	No. of UFM cases per 1000 student registered
0	1	2	3	4
1.	Agra	67,953	859	12.64
2.	Andhra	91,717	396	4.32
3.	B.H.U.	3,425	30	8.76
4.	Bangalore	35,182	36	1.02
5.	Baroda, M.S.	23,012	16	0.69
6.	Berhampur	9,038	85	9.40
7.	Bhopal	23,175	292	12.59
8.	Dibrugarh	11,628	57	4.90
9.	Gauhati	27,710	106	3.83
10.	Guru Nanak	50,504	1,437	28.45
11.	Jiwaji	25,327	378	14.92
12.	Jodhpur	8,405	31	3.69
13.	Kanpur	70,996	1,431	20.16
14.	Kashmir	17,442	239	13.70
15.	Kurukshetra	6,790	43	6.33
16.	Madurai	1,13,384	139	1.23
17.	Nagpur	1,07,004	1,972	18.43
18.	Panjab	1,55,822	3,714	23.83
19.	Poona	1,39,226	241	1.73
20.	Punjabi	47,263	673	14.24
21.	Rajasthan	95,502	602	6.30
22.	Ranchi	32,454	1,559	48.04
23.	Sardar Patel	13,732	26	1.89
24.	Saugar	23,006	288	12.52
25.	Shivaji	66,828	231	3.46
26.	South Gujarat	33,322	51	1.53
27.	Sri Venkateswara	43,110	262	6.08
28.	Udaipur	6,452	16	2.48
Overall		13,49,409	15,210	11.27

examinations during 1972-73, one student was alleged to have indulged in unfair means during the conduct of examinations.

Table II gives the frequency distribution of the mainstream universities over the index for unfair means. It appears that in 42.86% of the universi-

TABLE II
Distribution of main universities over the index of unfair means (as the number of unfair means cases reported for every 1000 students registered for exams)

Index	No. of Universities	Cummulative frequency	Percentage cummulative frequency
1	2	3	4
Below 3	7	7	25.00
3-6	5	12	42.86
6-9	4	16	57.14
9-12	1	17	60.71
12-15	6	23	82.14
15-18	0	23	82.14
18-21	2	25	89.29
21-24	1	26	92.86
24-27	0	26	92.86
Above 27	2	28	100.00

ties the index is less than 6 while in 82.14 it is less than 15.

It may be natural to expect the number of unfair means cases to increase or decrease with the number of students registered for examinations. In the present study the rank order correlation co-efficient between the two comes out to be 0.70. But that does not really help. It would be more desirable from the point of view of university governance to prove or disprove whether the number of unfair means cases increases at an increasing rate. One method of doing it is to find out if there is any relationship between the index of unfair means to the number of examinees. The rank order correlation between these two comes to 0.14 which is too small to stand any test of significance. This has an implication that we cannot take administrative unmanageability of university enrolments as an alibi for unfair means. We have to look elsewhere. In other words, unfair means in university examinations is not an administrative problem; it is basically a socio-economic problem and the causes as well as the remedies will have to be thought of in social terms. This is not to say that we can afford to be complacent as far as university administration is concerned. It has naturally to be geared to meet the difficult situation arising out of the use of unfair means in examinations.

It would be interesting to study the inter-faculty variation in the incidence of unfair. For this purpose various faculties were divided into three major

groups: (i) Arts and Humanities including Commerce (ii) Science and (iii) Professional faculties like Medicine, Engineering, Law, Education etc. Table III (on next page) gives the faculty-wise analysis of reported cheating during the examinations. The overall index of unfair means for Arts is 12.71 and it varies from 0.35 to 49.04 in different universities. In sciences the overall index is 8.10 and it ranges from 0.34 to 52.63. In the professional faculties the overall index is 7.88 and it varies from 0.00 to 42.29. The difference of the means of the indices for any two of the three major groups of faculties does not appear to be significant. This disproves the common notion that Arts and Humanities students are more prone to the use of unfair means in examinations.

Is violence during examinations a myth or a reality? Table IV based on the data received from the universities concerning the number of cases involving violence during 1972-73 examinations may give

TABLE IV
Number of students of the reporting universities indulging in violence during undergraduate examinations in 1972-73

S. No.	University	Total No. of violent cases
0	1	2
1.	Andhra	1
2.	Dibrugarh	1
3.	Guru Nanak	2
4.	Jiwaji	3
5.	Kashmir	1
6.	Punjabi	6
7.	Sri Venkateswara	1
8.	Others*	0

*Universities of Agra, Bangalore, Baroda, Berhampur, Bhopal B.H.U., Gauhati, Jodhpur, Kanpur, Kurukshetra, Madurai, Nagpur, Panjab, Poona, Rajasthan, Ranchi, Sardar Patel, Sagar, Shivaji, South Gujarat and Udaipur did not report any violent cases during 1972-73.

some partial reply to it. Out of 28 universities responding to the survey only 7 universities have reported some violent cases. Thus some violence has been reported only in 25% of the reporting universities. The maximum number of violent cases in any university during 1972-73 is 6. In terms of students who were alleged to have used unfair means, out of 15,210 students only 16 were reported to have resorted to violence. This means that out of about 951 students who use unfair means one tends to be violent. If we consider the total number of students, for every 84,338 students registered for undergraduate examinations one student tends to use unfair means accompanied by violence. In any case, if we go by reported cases, violence does not seem to be a

real problem. Being sensational in nature, violent cases are bound to attract more public attention.

In conclusion, we may say that cheating during the conduct of examinations is a universal problem. Every university is affected by it to a lesser or a greater degree. There is, however, no relationship between the size of the university and the incidence

of unfair means. There also appears to be no difference in different faculties as regards the magnitude of unfair means.

Talk of violence may also be rather exaggerated.

(Acknowledgement: The author is thankful to Shri A.K. Srimani, Statistician, A.I.U. for verifying and updating the tables).

TABLE III

Inter-faculty variation of the incidence of unfair means in the undergraduate examinations of 1972-73

S. No.	University	Index of UFM for Arts and humanities	Index of UFM for science	Index of UFM for Professional faculties	Remarks
0	1	2	3	4	5
1.	Agra	13.75	12.30	7.15	
2.	Andhra	5.55	2.42	0.00	
3.	Bangalore	0.35	1.10	2.58	
4.	Baroda. M.S.	0.83	0.34	0.65	
5.	Berhampur	12.15	9.27	0.00	
6.	Bhopal	17.77	10.92	4.80	Mass copying cases proportionately distributed.
7.	B.H.U.	12.68	3.91	0.31	
8.	Dibrugarh	4.56	6.37	4.89	
9.	Gauhati	3.59	5.18	3.11	
10.	Gurunanak	32.00	14.92	1.37	
11.	Jiwaji	15.82	7.02	39.44	
12.	Jodhpur	2.99	7.16	1.10	
13.	Kanpur	21.01	23.11	14.85	Mass copying cases proportionately distributed.
14.	Kashmir	10.67	20.41	0.00	
15.	Kurukshetra	12.73	21.58	4.07	
16.	Madurai	1.33	1.19	0.13	
17.	Nagpur	21.39	14.63	4.27	
18.	Panjab	23.21	14.47	42.29	
19.	Poona	1.74	1.74	1.65	
20.	Punjabi	15.36	8.28	9.69	
21.	Rajasthan	6.02	7.27	5.95	Mass copying cases proportionately distributed
22.	Ranchi	49.04	52.63	33.38	
23.	Sardar Patel	2.84	0.97	0.83	
24.	Saugar	12.58	12.72	12.14	
25.	Shivaji	3.45	4.06	1.23	
26.	South Gujarat	1.03	3.52	0.98	
27.	Sri Venkateswara	6.69	8.24	0.00	
28.	Udaipur	1.93	3.77	2.08	
Overall		12.71	8.10	7.88	

The United Nations University

What is envisaged is a net-work of cooperation among scholars and among institutions engaged in higher learning and research.

M. R. DUA

A UNITED NATIONS UNIVERSITY will come into existence in October this year with the commencement of the new academic year.

Except granting academic degrees, the United Nations University will perform all other functions which universities all over the world are looking after. The status, organisation, work and functions of the U.N. University will be distinctly different in case of selection of subjects for research, promotion of academic excellence, and emphasis of educational expansion in the developed and developing countries.

The prominent concern of the United Nations University would be to stimulate creative thinking and research in the fields hitherto untouched and unexplored. It would be, by and large, concerned with the study, training for research and consultation at higher and post-graduate levels.

The research under the auspices of the United Nations University is proposed to be organised in terms of specific problems and assignment on an inter-disciplinary basis. The University will concentrate neither its head offices nor its campus in one single country. What is envisaged is a net-work of cooperation among scholars and among institutions engaged in higher learning and research. The most significant problems which would be the business of the U.N. University would be largely determined by the concern of the world community at large.

The proposal to establish a United Nations University was first discussed in the U.N. General Assembly on September 23, 1972, at the suggestion of Austria, Colombia, Egypt, Finland, Ghana, Iceland, Japan, Jordan, Kenya, Lebanon, Malta, Peru, Philippines, Senegal, Sierra Leone, Syria, Venezuela and Tunisia.

The basic guiding principles on which the United Nations University is proposed to be established include :-

(a) The concept of the U.N. University would be that of a system of academic institutions, and not

of inter-governmental organisations;

(b) Close coordination would be maintained between the activities of U.N. Institute for Training and Research and other research organisations of the U.N. system and those of the U.N. University;

(c) Binding guarantees, under law of academic freedom and autonomy, would be written into the Charter of the University;

(d) Selection procedures would be established so as to ensure the highest intellectual and moral quality of the personnel of the University;

(e) The structure of the university would consist of programming and coordinating central organisations and a decentralised system of affiliated institutions, integrated into the world university community devoted to action-oriented research into the pressing global problems of human survival, development of welfare and the post-graduate training of young scholars and research workers for the benefit of the world community;

(f) The programmes of research of the institutions of the university would include, among other matters, co-existence between people of differing cultures, languages and social systems, peaceful relations between states and the maintenance of peace and security, human rights, economic and social change and development, the environment and the proper use of resources, basic scientific research and application of the results of science and technology in the interest of development;

(g) Capital costs and the recurrent costs are proposed to be met from voluntary contributions for the university made by:

(i) Governments directly or through U.N. specialised agencies or the International Atomic Energy Agency, and (ii) Non-government resources including foundations, universities and individuals. The U.N. University would also be authorised to receive assistance for its projects, particularly fellowships, for the U.N., the specialised agencies and other inter-governmental organisations.

These objectives and principles of the U.N.

University are based on the recommendations of a UNESCO Committee. It was decided on November 4, 1973, that the first university centre of the U.N. University would be located in the Tokyo metropolitan area in Japan. The University Council will, however, also consider from time to time the location of research and training centres and the programmes of the U.N. University as well as its associated institutions in all member countries. At the moment the Secretary-General of the U.N. will act as Rector of the University.

In order to finance its various activities, the U.N. University will seek cooperation from national governments, non-government sources, including foundations, national universities and individual sources. A new Rector is to be selected shortly.

Academic Activities

To begin with, the university will concentrate its academic activities on the study of major issues before the U.N. from a truly global rather than a national point of view for promoting greater understanding and achieving practical solutions in areas such as:

(a) International relations and peace, problem of peace-keeping, arms control and disarmament, human rights, international communications, (ii) International problems of development (e.g., the use of natural resources, rural and urban development, international trade and problems of developing economies, transfer of scientific and technical manpower, population problems and concern of youth), (iii) the environment and, the impact of science and technology on the environment (e.g. the question of world-wide ecological cycles, and the problems of the oceans and outer space). These only are some of the illustrations of the subjects that would be taken up by the U.N. University. The UNESCO Committee which has actively assisted in preparing the frame work of the university advised that the university should endeavour to anticipate problems likely to become of major international and regional concern and to promote research in order to obtain practical results;

(b) The need to provide new opportunities for fruitful contacts between scholars of the developing and the developed world and to promote centres of excellence in regions where they are now scarce or inadequate with the cooperation and support of U.N. agencies.

The U.N. University would provide one way by which scholars of the developing countries could engage in dialogue and cooperate with their counterparts in developed countries on a basis of equality. The university would be expected to *inter-alia* assist in bridging the scientific and technological gap between countries and help in building up the scientific and technological manpower of the highest calibre so urgently needed in the task of development. The university will recognise the need to initiate thinking and help intensify efforts of the institutions of higher learning in various parts of the world with regard to the objectives of the U.N. Charter and to link

these efforts in a systematic way to those of the other UN agencies and to encourage scientific analyses and evaluation of the problems and tasks faced by the UN system.

The other research institutions or universities doing similar work would all benefit through exchanges and joint studies and in other ways, from participation in the UN University. The structure of the university would be flexible, decentralised, geographically and functionally. The university staff will comprise of a Rector, a small unit constituting the central programming and administrative unit for the whole system. Besides, there will also be a number of units for advanced studies. In addition, contractual arrangements of affiliations, normally for specific purposes and functions would be sought with institutions outside the UN system, including departments and institutions of national universities and international scientific associations, qualified and willing to cooperate in the activities of the UN University. The central programming and administrative units will include a small group of distinguished scholars to assist in programming, (e.g., subject allocations among component functional centres and other units), a smaller group for finance, administration and servicing areas. The various UN research organisation which will help the UN University in its different phases are: The Institute for Training and Research, Research Institute for Social Development, International Institute for Labour Studies, International Institute for Educational Planning, African Institute for Economic and Social Planning, International Centre for Advanced Technical and Vocational Training, Social Defence Research Institute and the International Centre for Theoretical Physics. An expert body of scholars in various fields from different parts of the world would be constituted to function in an advisory capacity. The University academic bodies include: University Council, Executive Board and Rector.

The university will be endowed with complete and full academic independence. Efforts will be made to keep a working relationship with younger generation and ample opportunities will be afforded to scholars and youths of promise to be associated with initiating programmes and implementing them. The University's academic framework will prodigiously draw on the experience of the world academic community, students' organisation and other interested parties.

Most of the programmes of the UN University are estimated to cost \$100 million. The regular execution of the university's various schemes would cost \$17 million annually. A number of countries including India have already contributed to the UN University Fund: Japan \$50,000; UNESCO \$30,000; India \$5,000; Colombia \$5,000; Senegal \$2,000; and Austria \$1,500.

The establishment of the UN University has been commended by the UNESCO and has the blessings of most world academic institutions and research organisations.

M.P. Uchcha Shiksha Anudan Ayog

RAGHUVIR SAHAY NIGAM

THIS HIGHER Education Grants Body has been statutorily constituted by the Government for making "provision for the supervision and improvement of university education and other matters ancillary thereto."

The body consists of a Chairman and two members appointed by the state Government. The Chairman shall be chosen from amongst persons who are eminent educationists noted for scholarship and interest. One member shall be chosen from amongst persons of eminence in public life noted for promoting education. The other member shall be chosen from among officers serving or retired of the Central Government or any State government who have experience of administration in the field of education and or finance.

The Chairman and the members shall hold office for 5 years and shall be eligible for further appointment. The Body has been provided with a Secretary who has been a very successful and clear sighted educational administrator.

Will the grants from the University Grants Commission to universities and colleges be routed through this body? So far the state had been adding its share to any grant to any institution; but it could not find the discretion of U.G.C. It is in the U.G.C. that the power to scrutinise was vested. Of course the state by declining to contribute could influence the U.G.C.'s judgement which understood education better. Can the state muster talent with the necessary breadth of vision? Education, at least Higher is not a concurrent subject. In some states parochialism and linguism may be running riot, UGC can maintain an all India outlook and is in contact with educational thought abroad.

As far as it goes this Anudan Ayog will save the educational institutions from being subjected to the pleasure of the Secretariat people and the whims and preference of the Education Minister. The status of the Vice-Chancellors has been reduced by the 1973 unified Act. At least now they will be salaried a higher level of people. The Principals of colleges will not have to deal with Secretariat clerks.

This writer has seen an eminent V.C. with a file in the Secretariat just like himself when a Principal.

Under the Anudan Ayog Adhiniyam the State has full power over this Body since it provides funds; but the Government itself is subject to the will of the people. The legislators are not elected on educational considerations, nor education is a live issue in any election. Once it did disturb in Gujarat when

educated opinion had some say.

Education is subject to storms, ministerial, as well students' agitations. This Ayog will be less subject directly to the latter.

Madhya Pradesh is the only state that has chosen this wise course of instituting such a Body by law. Members chosen this time are men of calibre and have a good start. Let it be hoped that they would not be tormented by political pulls.

This writer had in his articles suggested formation of such a body, but this statutorily constituted body is a stronger one.

"It shall be the general duty of the Ayog to take all such steps as it may think fit and necessary for improving the organisation and promotion of higher education and for the determination and maintenance of the standard of teaching, examination and research in universities". The University Grants Commission as a contrast wants to vest in the universities the power to have Autonomous Colleges.

It is the Ayog that has "to accord its approval to the establishment of an institution for higher education and to the admission of such institution to the privileges of any university, and to the expansion of the activities of any college by adding new subjects to be taught at the degree level or by opening or adding to post-graduate classes." New educational institutions cannot start without the permission (which should be sought a year earlier) of the Ayog which will require particulars as the university hitherto for according the recognition and admission to the privileges of the university.

It is true that the universities have been freely granting recognition which ultimately in the case of private colleges meant a burden on state exchequer.

Has the university not been starting post-graduate classes even in science subjects in Government colleges and *ipso facto* acquiring recognition from the university without adequate provision? Recently the Government has taken over a dozen private colleges. Nothing by way of rationalising and revamping of staff, much less to say of curing defects and refurbishing and fully equipping has been done.

The Ayog on one side is expected to maintain standards of research and on the other side to engage itself in the matter of granting to a new college admission to the privilege of recognition by the university. The universities will be under the new Act—wholly tuitional bodies too constrained to engage in research etc. Individual scholars very zealous in their work may carry one. Team work with sanction required at each step, for there may be probings, leaving off, changing the direction etc will be difficult.

The Ayog is being saddled with work on all levels of importance. It is rather too much.

The State Government will have a fuller control over this body than on the universities through the coordination committee here which is packed with officials. It holds the purse strings.

The State is hiring the intellectuals—scientists, technologists and academicians—for helping in the production of more food and goods for the teeming

millions. It is no gratuitous relief. Just as the ministry is accountable to the electorate the intellectuals are answerable to the real, lasting good of the people who may be able to understand nothing more than the most blatant and noisy. But even amongst these there is a brain trust which is ignored by the rulers of the day. Even factory workers want to run their industrial concerns. Then why cavil at academics running the universities and other institutions of higher learning? Academics, scientists have to live within on education and science for a much longer time than ministers and governors.

Is ageing an inescapable 'fact of life', and death the price of higher early physical efficiency? Is life itself locked up in 'switched-on' cells? Research is showing a connection between the number of times a body cell has divided in a given time and its span of life.

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Age And Evolution

ROGER LEWIN

It is said that only certain thing in life is death. But why *should* ageing and death be inevitable. After all, given the chance, cancer cells can live for ever. In the wild, of course, the vast majority animals die long before their tissues show real signs of ageing. But there is no doubting that body cells, and the tissues these make up, do age. The molecular mechanisms behind the inexorable slide into death are giving a new class of scientists—so-called 'cytogerontologists'—a great deal to think about. And the most favoured idea at the moment is that ageing basically stems from a genetic mistake, or rather, mistakes.

Some students of evolution have argued that animals of a group *must* die if there is to be any form of selection. And the quicker they die the more rapid is the evolution resulting from selective pressures. But this reasoning seems weak because most animals pre-empt the ravages of ageing by succumbing to some kind of accident. It is therefore difficult to see how ageing could have been positively selected for. Indeed, since the whole driving force behind living organisms is to maximise their reproductive potential one would expect evolution to favour a long productive period within a long lifespan. In general, however, the opposite is true.

A persuasive explanation of this apparent paradox is that death is the price animals pay for greater

efficiency early in their lives. The reproductive period is usually concentrated very early in life so that overall generative potential is not curtailed by untimely deaths. But equally important, the inevitable appearance of mutations also favours early reproduction before these have built up to a harmful degree. Mutations may be contributory to ageing, as we shall see later, but we do know that cancer cells can rid themselves of them and continue to produce the 'pure' cell line.

Cytogerontologists realise that they cannot learn much by looking at, say, an old man, for he will be experiencing any number of symptoms of ageing, each of which might eventually contribute to his death. In other words, a cytogerontologist has to distinguish between cell ageing and death of the organism. He does this by isolating cells in a culture system and watching them mature.

Limited Life

It was Leonard Hayflick of Stanford University, in the United States of America, who really established cellular ageing in the test tube as a fact. He cultured human fibroblasts (the packing cells of connective tissue) over a period of time and counted the number of times they divided. He discovered that in every sample taken the cells had a life limit—now known as the 'Hayflick limit'—of about 50 to 60 divisions. This order of life span is in fact much larger than the cells would normally have achieved had they not been taken from their regular environment. In other words, the test tube experiments push the cells to their full potential and demonstrate that they do have a limited ability to divide.

Hayflick's results attracted a great deal of critical comment, most of it questioning the validity of relating cessation of cell division in culture with genuine cell ageing. But in his latest experiments, during 1973, he seems to have settled any doubt. Also his faith in the validity of this clonal ageing system is supported by a number of ingenious experiments on animals. For instance, Alan Williamson and Ita Askonas of Britain's National Institute for Medical Research (NIMR) shows that B-lymphocytes (the cells that give rise to antibody production) have limited division potential in intact animals.

Williamson and Askonas pass a clone of lymphocytes (that is, cells all deriving from the same 'parent' cell) through several 'host' animals and stimulate them to divide by presenting antigen challenge. They find that after about 60 to 70 divisions (near the Hayflick limit) the clone simply fades away; the cells ability to divide and, therefore, die.

Charles Daniel of the University of California finds a similar situation with mammary cells from mice: passing the cells from animal to animal, and each time stimulating them to divide, eventually exhausts the cells of the ability to do so. He shows, too, that it is the number of divisions rather than the time span that brings on senescence: it makes no difference to the total number of divisions whether the experiment is spread over six years or crammed into

two. It seems, therefore, that the number of divisions is 'counted' in some way. But how?

Error Theory

There are scores of suppositions about ageing, but the one most backed up by data is the so-called 'error theory'. The idea is that since both DNA and protein synthesis can never be 100 per cent perfect, some errors are bound to creep in. About ten years ago, Leslie Orgel, of the Salk Institute, California, theorised that the errors would build up slowly at first, but would then accelerate, causing an 'error catastrophe' leading to cell death. In other words, the errors in the system would eventually help to perpetrate even more mistakes, giving an exponential rise of defective proteins to a level with which the cell could not cope.

That was the theory. Now there is substantial experimental support, principally from the laboratory of Dr Robin Holliday who, with colleagues of NIMR, has demonstrated that as a culture ages there is a marked rise in the level of defective proteins (he has looked at a number of specific enzymes). Moreover, by exposing cells to 5 fluorouracil, a chemical that induces mistakes in the protein-synthesising system, he can plunge them into premature senescence and advance the rise in defective proteins.

Holliday and colleagues have also looked at the proteins of patients with Warner's syndrome, a disease causing premature ageing. The results fit in with the 'error theory' in that the patients' cells show a premature rise in defective proteins.

But how does the error occur? Initially, of course, it is through the small inherent inefficiency of the system. But it is possible that the error rate is also enhanced—by mutations for instance. Mutations arise both from external influence, such as radiation, and through factors built into the cell's own metabolism. Young cell systems can select out those cells that incur serious mutations, whereas old tissues, because they are growing less vigorously, cannot. Clearly, there must be some link between mutation errors in protein synthesis.

Stop Switch

Another possibility is that ageing is actually built into the genetic blueprint so that after a pre-set number of cell divisions a switch is thrown which brings cell viability to a stop. If this is so it is easy to explain why, when they are grown in culture, cancer cells go on for ever—they never age nor stop dividing. All one has to postulate is that the switch is struck in the 'on' position.

If the error theory is right, however, cancer cells have to be a bit more subtle to achieve their immortality: the cell population has to ensure that, as a whole, the errors are maintained below the catastrophe level. This can be done simply by the vigorous growth of the culture selecting out error-prone cells; the remaining cells can then continue to produce error-free, or rather error-low, progeny. Whatever is the reality of the mechanisms behind ageing, cancer cells, as usual, seem to hold the secrets. □

Players and Coaches

PAVLOV the famous psychologist would have miserably failed in his "dog and food experiments" had the subject of his queries been a sick one. Neither would a sick dog salivate as easily, nor as spontaneously were he to be running high temperature. Man being higher in the stages of evolution needs all the love and understanding if we aim at getting the best out of him and his reflexes in the sports arena. He is surely more than an automatic consumer of calories and the usual hours of vigorous exercise drilled into him.

Physical training experts the world over would agree that a mere physical well being of an athlete or a player though very essential for any sports or games is not all that a player needs. A general feeling of well being and a whole-some attitude towards our players can never be over emphasized.

Keeping in view this psychological need of an individual in any walk of life be it sports or elsewhere we must sooner or later evolve a formula that happily combines a proper coordination of the required reflexes in any particular game plus a deep focus on the emotional side of a player. A true insight into the working of a group in a play inevitably implies a genuine understanding between the expert or the coach and the group as a whole and individually.

A thorough understanding of every individual player can go a long way in achieving the best of results. A complete knowledge of the player's background and environment plus a sympathetic dealing on the part of the coach can easily produce giants amongst our talented sportsmen of which we have no dearth.

The coach must also understand that a worried player will be doubly prone to make mistakes and therefore this becomes the first duty of the coach to restore his confidence. A few quiet words of encouragement given individually to each player can work miracles. And once the tension has been released it may be possible to remotivate the team or group thus bringing about a proper coordination of each number in team. It is also essential that for a each player the coach must vary his methods of approach from one player to another.

The physical training expert must have the qualities of true leadership that comes from within and evidently, as far as his own well being goes his selectors and people on the top must ensure a feeling of security in matter of their choice without which the former has been seen to produce utter chaos at the big sport events thereby letting down not only his players but the entire country. Once this atmosphere of complete harmony is achieved minor problems can easily be sorted out.

The players in their turn must learn to abide by the major decisions of the leader particularly at important stages, for example, a player might not be considered suitable enough to be placed in a position

of his own liking. He must learn to adopt himself for the greater good of the team and its objective. And if he still finds it unbearable he can sort out the same in a private interview with his coach who is duty bound to reconsider his proposal and may make the necessary adjustments. If, however, the coach wants the last word, the particular players must be disciplined enough to give in at that moment. Such a case is not an isolated one.

To sum up, any training programme for the players and coaches cannot afford to overlook the emotional and psychological needs of the individual. A certain sense of security of his own status and that typical affection between the players and the coaches will provide the answer in the shape of true motivation and excellence thereafter. Once we have fulfilled these requirements we can rightly expect the team to

Psychological Needs

gain greater heights not only in sports fields but in society as well. Perhaps we have devoted a much longer time in calculating the input of food but shabbily neglected this major flaw of an individual's deeper requirements. Requirements of a total individual and not his physical comforts alone. We have trained experts to look into the minutest of muscular training in any Physical Training Institute of today.

It is this area of understanding that has remained almost vacant in spite of many an able sports organisation and sport.

Personal likes and dislikes are yet another hazard at the time of selection and grooming of the players. Here it may be pertinent to point out that many a time extraneous influences have done immense damage by showing undue favour to some and a sheer neglect of other deserving cases. In due course this frustrated lot is bound to give vent to their feelings in more than harmful ways. Keeping in view the element of human error in this regard, we must by and large keep aside our personal preference and leanings, else we have failed in creating a congenial emotional atmosphere so essential to a group or an individual player. It is, therefore, time to devote ourselves to the non physical needs of our players and coaches if we are to see them bringing not only laurels in the field of sports, but also see that they remain balanced and stable in the face of defeat. A healthy acceptance of the latter is, to my mind, even more important than winning a tournament. This can be possible only if we take the situation in hand with immediate effect. Perhaps a few lectures on this subject at the very inception of a training programme for sportsmen will go a long way in producing the necessary results.

—LAKSHMI CHHABRA

Round Up

Package Scheme to Get Back Scientists

THE Government of India approved a scheme prepared by the Council of Scientific & Industrial Research to attract Indian Scientists, Technologists and Engineers currently employed in responsible positions in Research and Development and manufacturing establishments in foreign countries.

This scheme would promote the return to India those Scientists Engineers and Technologists who having completed their studies or research abroad and have taken up jobs in production departments or management positions in industrial firms abroad due to lack of employment opportunities in India

This package scheme is framed on the lines Entrepreneurship Development scheme presently being operated by the Ministry of Industrial Development.

The facilities offered under this scheme would be:

(a) Scientists / Technologists who are abroad will be permitted to keep the foreign exchange earned by them in their foreign bank account for a period of 3 years instead of 30 days. (b) Permission will be given to use this foreign exchange for importing equipment, machinery, capital goods, raw materials etc. In order to avoid delay, the essentiality and availability certificate from DGTD will be waived. (c) A simplified procedure will be adopted for (i) licensing, (ii) capital goods clearance, (iii) and issue of an import licence. The candidate

should make a detailed statement of the items of equipment etc. that he proposes to import and that foreign exchange is being met by him from his own account. (d) CSIR will set up a Bureau to offer advice to the Scientist/Technologist returning from abroad to match his skills with the local market needs and facilities. (e) Financial institutions such as IDBI, IFC, State Bank of India etc. will be requested to extend their present facilities to include entrepreneurial loan on special terms.

Council of Scientific & Industrial Research will be the implementing agency to the scheme. A Committee under the Chairmanship of the Director - General, Scientific & Industrial Research and consisting of representatives of the Ministry of Finance, Ministry of Industrial Development, Directorate General of Technical Development, Department of Science & Technology, the Indian investment Centre and the CSIR has also been set up to advise on its implementation.

The Indian scientists abroad may send a proposal which if accepted will be given the necessary package assistance. He may contact the Indian Embassy and chief (Technology Utilisation) CSIR for further details for processing his proposal.

CSIR would be the executing agency for the implementation of the scheme. The Indian Investment Centre will function in close liaison with the advisory Commit-

tee will be responsible for getting in touch with State Governments where the projects are to be located and assist the entrepreneurs in sorting out the problems of supply of water, power, land etc.

The contact point abroad would be the Education/Scientific Attache in the Indian Embassy or Chief (Technology Utilisation), Council of Scientific and Industrial Research, Rafi Marg, New Delhi-1

Methodology of Research Course

A 3-week 'Intensive course in the Methodology of Research' was conducted in Madurai University from 20th May, 1974. This course was organised at the suggestion of the Vice-Chancellor, Dr. M. Varadarajan. Consequent on the revision of rules governing research, Teachers in the first grade colleges affiliated to this University who had put in at least 7 years of experience, were permitted to register themselves for Ph.D., in the academic year, 1973-'74. 63 teachers representing both Humanities and Sciences attended this course.

Lectures in the first week were common to both humanities and sciences and they covered such subjects as 'Epistemology', 'Logical Methods', 'Documentation', 'Mechanics of Thesis Writing' and 'Standards of Research'. In the second and the third weeks, the two groups of teacher candidates were separated. The science group heard lectures on 'Literature Survey', 'Critical Appraisal of a Research Paper', 'Planning Experiments' and 'Importance of Observation and Collection of Data'. Lectures for the other group covered such topics as 'Problems Research and Interpretation' and 'Methods of Research' including normative, historical and statistical methods.

This course was conducted with the assistance of University Grants Commission. Dr. V. Suchithanandan, Professor of English, Madurai University, was the convenor of the course.

Incentives to Scientists

CSIR Scientists, Technologists and Engineers, individually or in association with other, can set up industries based on CSIR know-how for commercial utilisation and for exploitation of researches carried out by the CSIR for industrial development.

The purpose of this scheme is to create cadre of entrepreneurs to experiment with new ideas and methods of organisation and to facilitate transfer of technology. Under this scheme a Scientist / technologist / engineer would be free to choose either a process developed by him or any other process of CSIR Laboratory/Institute that he may like to take up for production. He can avail of the facility of use of pilot plant and other equipment etc. against suitable charges. CSIR will grant extraordinary leave for a period of three years to such Scientists. On expiry of the leave, he will have to either join back the service of the CSIR or resign his post, or seek voluntary retirement as permissible under the rules.

Dr. Lahiri Retires

DR A. LAHIRI, Director, Central Fuel Research Institute, retired on 26th May, 1974 after 30 years of glorious service. Coming back to India after several years of intense war-time research in England, Dr. Lahiri joined the Council of Scientific and Industrial Research in 1945 as the Assistant Director (Planning), Central Fuel Research Institute. CFRI then existed only on paper in a small office at the Indian School of Mines, Dhanbad where it functioned till 1950.

On his retirement, Dr. Lahiri leaves behind a 200 acre estate of the present Central Fuel Research Institute, with its spacious research and administrative building,

numerous pilot plants, the technological block, the workshops and a sprawling residential colony which all add up to a pleasant relief to the drab and dreary coalfield topography.

A recipient of many coveted awards from Universities, learned institutions, etc., perhaps he cherished most the ones which came from the Government when the President of India invested him with the Republic Day Awards of Padma Shree and Padma Bhushan in 1960 and 1969 respectively.

Distinctions were conferred on him by many a foreign and national learned Society, Committee etc. which accepted him as Member/Fellow/Office Bearer. He is a Fellow of the Indian

National Science Academy and also Member of its Governing Council.

Dr. Lahiri took extensive tours abroad and with his expertise left an imprint in the fields of his specialization in boosting the related R & D efforts in the country on modern lines.

Dr. Lahiri is a man with a keen aesthetic sense. His personal tastes show amply in his vast collection of books as well as musical records, and his rose garden which occupies his time and devotion whenever he could find time from his official engagements.

At the end of the long and fruitful innings at CFRI, Dr. Lahiri has taken up a UNDP assignment in Chile as Adviser.

Vivekanand Laboratory to be developed

THE Vivekananda Laboratory at Almora is to be developed by the Indian Council of Agricultural Research. The laboratory will be so reorganised as to make it an important centre conducting research work on hill agriculture.

Established by late Professor Boshi Sen, an eminent agricultural scientist, in 1924 at Calcutta the Vivekanand Laboratory was later shifted to Almora. Since 1959, the laboratory forms a part of the Uttar Pradesh Agriculture Department.

The laboratory is a pioneer in many fields. The laboratory has several firsts to its credits in the fundamental and applied fields of plant research. In collaboration with agricultural unit of the Defence Ministry it is working on high yielding varieties of millets suitable for hills.

Persistent approaches had been made to the Prime Minister, the Planning Commission and the Indian Council of Agricultural Research for developing the laboratory into a first class institution for agricultural research

in temperate regions. The demand has been accepted.

The formal taking over of the laboratory by the Council is expected to take place by July this year. The Laboratory will function as an autonomous institution and will be known as Vivekanand Agricultural Research Institute.

The development of the Laboratory and its conversion into a national institute will prove an important landmark in expanding farm research work to benefit the entire mountainous region of the country.

'Sports Medicine' Volumes

The NIS library has received back volumes from 1956 to 1973 on Sports Medicine, a joint gift from the Japanese Society of Sports Medicine and Department of Physiology of Jikei University of Tokyo. These Journals contain valuable research material by various experts in the field of Sports Medicine.

ICHR's "Towards Freedom"

THE Indian Council of Historical Research has decided to compile, edit and publish a volume entitled "Towards Freedom" which will trace the origin and development of the mass movement in the country which led to its freedom in 1947. In addition, as part of its project to translate all Persian sources of medieval Indian History into Hindi, the Council has undertaken to translate into Hindi the Persian sources of Akbar's reign. This forms part of its plan to give source orientation to the teaching of history in colleges and Universities for which it is preparing a series of source volumes on Indian history.

IAAP Conference at Montreal

THE International Association of Applied Psychology will hold its 18th international Congress in Montreal, Canada, from July 28th to August 2nd 1974. Members of I.A.A.P. as well as non-members, and University students, are invited to attend the Congress in order to profit from the presentations of some of the world's eminent scientists. Universities of the Province of Quebec, of Ottawa, of Toronto, the Canadian Psychological Association, the Canadian Guidance and Counselling Association, the Corporation of Psychologists of the Province of Quebec, the Corporation of Guidance Counsellors of the Province of Quebec, the Conference des Recteurs et Principaux de la Province de Quebec, the Association of Universities and Colleges of Canada and the Governments of Quebec and of Canada, are directly contributing to that scientific convention of worldly prestige.

U. K. Professor's World of Tomorrow

AN entirely synthetic heart that will take over the almost incredible pumping job of the natural one, an artificial kidney that is small enough to be placed into the body, a sewing machine to relieve surgeons of the lengthy business of stitching up wounds, and a lifting machine for getting patients in and out of beds—these are some of the machines that need to be developed in the near future, according to Professor Meredith Thring of London's Queen Mary College.

Professor Thring's ideas for machines come under his own heading of "humane engineering"—the use of mechanical engineering for the good of mankind. Another of his machines that remain to be developed is one that would be able to lift a cripple out of a wheel-chair and into a car, stacking his chair on the roof, unaided. There is, too, he says, a need for a machine that would enable a hand-operated wheel-chair to go up or down two or three steps, so giving a cripple much more mobility in buildings than he has now.

Professor Thring is himself engaged on, among other things, a mining machine that will take 10 years to perfect, he thinks. This would be able to mine thin or deep seams of coal that are now impossible to get at as well as more normal coal measures. Completely controlled from the surface, it would make underground workers unnecessary and it would increase usable coal reserves by about five times. Similar machines will have to be developed to crawl about on the seabed, doing all the work on natural gas or oil well heads that is now done from floating platforms, with their risks in storms.

Another of Professor Thring's projects is an experimental farm in which as much use as possible is to be made of solar and wind power. One of its main products will be protein from grass and crops. Solar energy, for instance, will be used to dry the fibrous residues after juice has been extracted and a 5 kW windmill will pump water into a reservoir for irrigation.

Lecturing in London recently, Professor Thring also had some ideas on transport—and staying still! He put forward the idea of aircraft with removable wings. The fuselage of the machine, with the passengers in it, would have its wings taken off. The fuselage would then be hooked on to a monorail and whisked into the centre of a city, customs officers doing their job en route. The wings would be attached to another loaded fuselage brought out on the monorail, to form another flying machine. To combat noise and high inefficient fuel consumption on take-off, Professor Thring said that the aircraft could be accelerated to flying speed along a monorail, its own engines taking over at the end (which is really like some of the early ideas for aircraft at the beginning of this century).

On standing or sitting still, Professor Thring said that many people could do their jobs perfectly well at home, communicating with each other via TV and telephone links and connecting information files and so on via computers. There would be far less of a rush hour if this could be done and less need for gigantic office blocks.

Dr. Randhawa Honoured

THE University of Udaipur conferred the degree of Doctor of Science (honoris causa) on PAU's Vice-Chancellor, Dr. M.S. Randhawa at its Eleventh Convocation on March 18.

The citation said: "In his contribution to such diverse fields of human striving as science, art-criticism, agriculture, city planning literature and architecture, Dr. M.S. Randhawa approaches the classical description of a complete man—a man whose sensitivity is many-sided and can grasp the minor laws of arts and sciences". Dr. P.S. Lamba, the Vice-Chancellor of the University, who read the citation, went on to add: "The famed rose garden at Chandigarh is more impressive and fragrant monument to the genius and achievement of Dr. Randhawa than could be erected with words by a chronicler of the future."

Ford Aid For U. G. C.

FRESH proposals have been made to the U.G.C. by the Ford Foundation for aid. According to the details available, a detailed proposal indicating some priorities such as the teacher education and training of university administrators has been suggested. The note is also believed to have mentioned aid for purchase of scientific equipment. Though the UGC Chairman conceded that a proposal had come but he added that any aid would be on the basis of equality and would be carefully studied. Ford grants to various universities had been frozen at the time of the Indo-Pak war. Recently there has been a partial relaxation of the freeze on the old grants even for a limited faculty exchange programmes, and funds were also permitted for some select programmes and for purchase of scientific equipment.

Degrees For NDA Cadets

NATIONAL Defence Academy cadets will for the first time receive degrees from a recognised university. The first lucky batch of the cadets who were trained to achieve this status during a three-year course are from the 46th course. The academy is now an affiliate of the Jawaharlal Nehru University. The decision to raise academic training to the degree level in the academy was taken following a review of its syllabus by a committee headed by Dr. G.S. Mahajani, Vice-Chancellor of Poona University in the light of the fast technological developments and sophistication of weapons. The graduation ceremony will precede the passing out parade of the cadets to be held on the following day.

Central University at Pondi

THE prospects for another central university at Pondicherry from the next academic session have turned out to be gloomy. Even the establishment of Central university at Hyderabad has been deferred by at least one year for unspecified reasons. Both these proposals had been accepted by the Union Government in principle and both the committees set up were headed by UGC Chairman Dr. George Jacob. With an affiliating university already functioning in Hyderabad, the new university will be strictly residential. The existing colleges in Hyderabad will continue to be affiliated to the Osmania University. With the addition of Hyderabad and Pondicherry the number of Central universities will rise to eight. The existing six are Aligarh, BHU, Delhi, Visva Bharati, Jawaharlal Nehru and North Eastern Hill University. Though no reasons are assigned, the only logical explanation for delaying the setting up of two Central projects seems to be lack of resources. The Rs. 30.79 crores provided for the University Grants Commission in the annual plan for 1974-75 is hardly adequate to meet its existing commitments.

Improved Returns From Fertilizers

WITH agriculture reeling under the blow of sharp increase in fertilizers, Dr. M.S. Randhawa, Vice-Chancellor of the Punjab Agricultural University told the delegates to the summer Institute Micronutrients and Secondary Nutrient Elements in Agriculture that the returns from fertilizer application can be easily increased to about 14-15 kgs of grains per kg of nutrient provided deficiencies of the limiting nutrient elements are identified and corrected. The Institute has been organised by the Indian Council of Agricultural Research and 20 delegates from ten States are attending it.

He disclosed that iron deficiency had been observed in many paddy nurseries. In such cases spraying of neutralized ferrous sulphate has been found to remedy the situation with an insignificant expenditure. Growing of legumes, he said, has been suggested as an alternative to bringing about economy in fertilizer use and to obtain larger amount of proteins. Under certain situations, a gram of molybdenum may harness more energy through greater conversion of sunlight into plant material than can be obtained from a gram of uranium converted to TNT equivalents. In molybdenum deficient soils, dependence on fertilizer imports may be decreased and fertilizer shortages may be overcome if we can use phosphorus and molybdenum to synthesize nitrogen. On the other hand, molybdenum has been found to cause toxicity problem in some alkali soils which can be solved by adding gypsum.

Dr. Randhawa emphasised that techniques for accurate and rapid soil analysis should be developed. Zinc, molybdenum, sulphur and magnesium may increasingly become the nutrients which may help to increase efficiency of major fertilizer nutrients.

INA Fellowship For Scientists

THE Indian National Academy has admitted three scientists to the fellowship of the academy and announced awards to five other scientists.

The scientists admitted to the fellowship for 1974 are: A. Ramachandran, Secretary, Department of Science and Technology, New Delhi, Prof. C. N. R. Rao, Professor of Chemistry and Dean of Research and Development, Indian Institute of Technology, Kanpur and Dr. H. K. Jain, Head of the Division of Genetics, Indian Agricultural Research Institute, New Delhi.

The scientists who received the Science Academy awards are: **Srinivasa Ramanujam Medal (1974)**: Prof. Harish Chandra, Professor of Mathematics, Institute for Advanced Study, Princeton, New Jersey, USA, for his outstanding contribution in the field of pure mathematics. **Shanti Swarup Bhatnagar Medal (1974)**: Dr.

A. N. Khosla for his outstanding contribution in the fields of engineering.

Sunder Lal Hora Medal (1975): Prof. L. S. Ramaswami, Professor of Zoology, Rajasthan University for his significant contributions to endocrinology of reproduction in vertebrates.

Meghand Saha Medal (1975): Prof. T. R. Govindachari, Director, CIBA Research Centre, Bombay, for his outstanding contribution in the field of organic Chemistry, particularly in the area of indole alkaloids, terpenoids.

Kariamanikkam Srinivasa Krishnan Memorial Lectureship (1975): Dr. A. P. Mitra, Radio Science Division, National Physical Laboratory, New Delhi, for his outstanding contribution in the field of earth's near space environment, especially in ionosphere and Aeronomy, and in the areas of space physics.

Gujarat To Take To Changed Pattern

GUJARAT has decided to change the pattern of education and the new 10+2+3 formula is to be introduced shortly. Addressing a meeting of the Council for Higher Education and Research at Ahmedabad, Mr. K. K. Viswanathan, the Chancellor, said that the first batch of students appearing for the secondary examinations under the new scheme was expected to come out of schools in March 1976 and thereafter the arrangements for the post-secondary course would be completed by June the same year.

He said that the colleges and the universities would be in better position to fulfil their aims and ensure smooth functioning if only properly motivated students entered their portals. He supported the concept of autonomous colleges to give greater initiative and

freedom of action to individual colleges but he however said the broad measure of autonomy should include teaching methods and evaluation of student performance.

The improvement of relationship between the teacher and the taught was of vital importance and such a contact would become impossible if the educational institutions had to cope up with unmanageable number of students.

First Hand Contact Helpful—Reddy

Mr. N. Narotham Reddy, Vice-Chancellor, Osmania University, recently inaugurated at Hyderabad a seminar sponsored by the Union Ministry of Education and jointly convened by Osmania University and the U.S. Educational Foundation in India.

He observed that first hand contacts always helped one to

PERSONAL

1. Justice B.K. Patra has been appointed Vice-Chancellor of Berhampur University w.e.f. 17th June, 1974.
2. Mr. S.K. Mukherji, Assistant Director-General, ICAR, has been appointed Vice-Chancellor of Rajindra Agricultural University, Smastipur.
3. Dr. N.K.A. Rao, Dean, Faculty of Agriculture, G.B. Pant University has been appointed Deputy Director-General, Indian Council of Agricultural Research.
4. Mr. R. Tirugnanasambandam has been appointed Registrar of Madurai University w.e.f. 12th June, 1974.

gain a correct perspective, especially on a vast country like India. He felt most Americans had some set notions about India and that generally the educated Indians evinced more interest in developments in the U. S. than his American counterpart showed in India. These attitudes and the intensity of interest were reflected in the Press in both the countries.

The American Group Leader, Dr. William M. Gabard, recalled his earlier visits to India and said knowledge of India's ancient culture had given him a new perspective of his own culture. He said that India demonstrated that tradition and modernity can co-exist.

Atom Smasher For 'Poona Varsity'

POONA University has been given an atom smasher as a gift by the U.S. Atomic Energy Commission. The Rs. 8-lakh machine called 'Microton' was recently brought to the university and is to be housed at the Physics Department. Built at the Lawrence Radiation Laboratory in California, the 'Microton' is capable of hurling bullets of atomic particles called 'electrons' at a speed of about 1,00,000 km. a second. These fast neutrons particularly are now used in cancer therapy.

Vocational Courses

THE Universities are introducing job-oriented degree courses. Recently the Academic Council of the Bangalore University approved an ambitious project for introducing about 25 vocational subjects from the current academic year.

According to Dr. H. Narasimhaiah, Vice-Chancellor, new optional subjects for degree courses and diploma courses as additional facility to obtain useful vocational qualifications were being introduced keeping an eye on the employment potential in different fields as also the requirement of trained personnel by the Government for implementing the plan programmes.

The new optional subjects scheduled to be introduced for degree courses, he said, were tourism, education, management, store keeping and store accounting, computer programming, operational research, horticulture, silviculture and pisciculture. Besides these courses the Academic Council had also decided to introduce postgraduate diploma courses in industrial management, business management and instrumentation.

Joint Cosmic Ray Experiment

THE Tata Institute of Fundamental Research, Bombay, the Physical Research Laboratory, Ahmedabad, and the University of California, Berkeley were participants in a jointly designed cosmic ray experiment conducted in Skylab III. The experiment involved the exposure of an assembly of Lexan polycarbonate dielectric detectors during the Skylab mission.

The objective of the experiment was to study in detail several components of corpuscular radiation in space, both of solar and galactic origin, which are of low intensities and hence are not accessible for studies in balloon and rocket experiments. The Skylab provided a special opportunity for studying these components.

Dielectric detectors were used because they are capable of withstanding the thermal and the radiation environment of free space for a prolonged period of time, i.e. for several months, without any significant loss of their sensitivities.

Skylab III was launched by the National Aeronautics & Space Administration in the middle of November 1973 with a crew of three astronauts: Col. Gerald Commander; Dr. Edward Gibson Science Pilot; and Col. William Pogue, Pilot. Carr and Gibson deployed the detector outside Skylab during their first space

walk in the third week of November 1973. At the conclusion of the Skylab mission, the detector was retrieved by the astronauts and returned to the earth in early February 1974.

The part of the detector assigned to Indian experimenters arrived in India in March 1974. This detector had an exposure of 72 days in free space with a negligible amount of shielding material. This is the longest free space exposure of an experimental detector which has been brought back to earth, and the first successful satellite experiment by researchers in India. The detector is expected to yield new and valuable information on particle radiation in free space, both of galactic and solar origin, as well as on the micrometeorites.

The study of the exposed detector is being made jointly by the research groups of Prof. S. Biswas of the Tata Institute, Prof. D. Lal, Director, Physical Research Laboratory, and Prof. P.B. Price of the University of California, Berkeley, USA.

New Director of CFRI

DR. M.G. Krishna assumed charge as Director, Central Fuel Research Institute, Dhanbad, on June 5, 1974. He was Director of Indian Institute of Petroleum, Dehra Dun, since 1964 before taking up his new assignment. He reminded the scientists about their responsibilities in view of the special position coal has acquired in the context of severe oil shortage and energy crisis in the country today. From CFRI he will act as the Chief Co-ordinator for R & D programmes in the field of Coal and Energy including programmes concerned with coal utilisation and petroleum.

Dr. Krishna has widely travelled. His visit to Austria, U.S.S.R., W. Germany, U.S.A., Mexico, France, Finland, Holland, U.K., Tehran, and Iran has been in connection with scientific meetings, symposia, congress, etc. on R & D. on petroleum and related fields.

Special Study of Job Requirements

A STUDY is to be shortly initiated by the Planning Commission to assess the unemployment among engineering personnel in the country. The All-India Council for Technical Education has made a special request to the Planning Commission to take up this work. The Council at its meeting in New Delhi has noted that the supply of technical manpower in the Fifth Plan is more or less pre-determined by the admissions that have already taken place in engineering colleges and polytechnics. Selected institutions in the country may be assigned the responsibility of assessing the requirements of manpower, both degree and diploma holders in all principal sectors of employment.

Since there is a serious unemployment among engineering personnel at present the Council has suggested that it is necessary that the Planning Commission undertake a special study of the job requirements of various categories of technical personnel to determine the employment pattern of engineering graduates and diploma holders.

PHYSICAL SCIENCES

Mathematics

1. Balasubramanyam, Rao. On some aspects of hydro-magnetic channel flows. I.I.T., Delhi.
2. Chiplunkar, Avinash Vishnu. Global dimension of algebra of differential operators. University of Poona.
3. Chugh, Vas Dev Lal. A study of zeros and means of a class of entire functions. University of Delhi.
4. Joshi, Vijayshankar Shivshankar. Contributions to the theory of power-free integers and self-numbers. Gujarat University.
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Physics

1. Chakravarty, Subhashchandra. Studies of radiowave propagation in the lower ionosphere. Gujarat University.
2. Gopinathan Menon, K.K. Ultrasonic studies of metals and alloys: Bismuth and some of its alloys. M. S. University of Baroda.
3. Goswami, Amit Prasad. Dielectric and other properties of thin films. University of Poona.

Chemistry

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2. Chakrabarti, Prasoon Kanti. Studies on synthetic substitute enzymes and other peptides of possible biological interest. Kanpur University.
3. Chandramouli, N. Synthetic and structural studies in the chemistry of billavones. University of Delhi.
4. Chandra Prakash Rao Anantaneni Surya. Studies on bakuchiol: A monoterpene phenol. University of Poona.
5. Chattopadhyaya, Jyoti Bikash. Some aspects of the chemistry of sulphur dyes and other sulphur compounds. University of Poona.
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10. Kapoor, Chiranjeev Lal. Chemical studies in relation to bilirubin toxicity. Kanpur University.
11. Khanolkar, V.D. A study of coordination complexes: Transition metal complexes of orthohydroxy acetophenone oxime derivatives. Marathwada University.
12. Mujumdar, Ratnakar Balwant. Isolation and structural elucidation of wood phenolics. University of Poona.
13. Natu, Gopal Narayan. The study of metal complexes. University of Poona.
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15. Patel, Nagjibhai Desaiabhai. Vibrational spectra of the deuterated dihalogenated benzenes. Gujarat University.
16. Shah, Dineshkumar Keshavlal. Corrosion inhibitors. Gujarat University.

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19. Verma, Vishnu Prakash. Some aspects of the chemistry of uranyl selenites. I.I.T., Delhi.

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Botany

1. Hilda, A. Studies on the blast disease—host specificity of pyricularia. University of Madras.
2. Jalaja, N.C. Studies on the radiosensitivity of saccharum special. University of Madras.

Zoology

1. Ahluwalia, Jasleen. Study of viscerosomatic reflexes in the cat. University of Delhi.
2. Bhat, Krishna Murthy U. Studies on insect cells cultured in vitro. University of Poona.
3. Dastagir, Tayyaba Sultana Syed Khaja Gulam. Studies on some protozoan parasites of arthropods. Marathwada University.
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5. Madlapure, Venkat Rajaram. Biology of Barbus puntius and Barbus ticto (Hamilton). Marathwada University.
6. Malleshappa, Y. Microflora of buffalo milk and microbial metabolism in milk. Bangalore University.
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8. Panickar, R. Govinda. Histophysiological studies on developing and adult avian gizzards. M.S. University of Baroda.
9. Patel, Dharmdasi Chinubhai. Metabolic fate of bhydroxy-butyrate in rhizobial species. M.S. University of Baroda.
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1. Angadi, Channabasappa Veerabhadrappe. Studies on bacterial leaf blight of rice. University of Madras.
2. Aravindakahan, C. Studies on fertilizers and materials related to fertilizer industry. University of Madras.

3. Chandralata, B. Studies on fusarium wilt of cotton. University of Madras.

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1. Khan, Praveen. Personality structure of women in the nursing profession. Kanpur University.

2. Shah, Anand Gokaldas. Some personality and situational variability influencing successfully inter-personal perception. Gujarat University.

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2. Gupta, Pratap Narayan. The theory and practice of judicial review in India: A comparative study with special reference to U.S.A. Kanpur University.

3. Gupta, Vijaya Prakash. Problems of parliamentary democracy in a multi-racial society, Kenya. University of Delhi.

4. Javed Alam. Crisis of legitimacy: A case study of Indian Parliament. Jawaharlal Nehru University.

5. Srinivas, M.V. American view of Muslim separatism in India, 1939-47. Jawaharlal Nehru University.

Economics

1. Chauhan, Yogendra Singh. Economics of intensive crop rotations (commercial enterprize) in Farrukhabad District. Kanpur University.

2. Kamble, Namdeo Dnyanoba. A cross section analysis of the structure and determination of spatial distribution of manpower resources: A case study of Maharashtra. Shivaji University.

3. Saxena, K.C. Zonal difference in crop output growth in Madhya Pradesh. Jabalpur University.

4. Shukla, Daya Shankar. Role of maize farming in the economic development of Jaunpur District. Kanpur University.

5. Thakore, Gajendrasinh Devisinh. A study of agricultural implementation programme. South Gujarat University.

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1. Gavaskar, Kashinath Manohar. Development of a firm: A general survey of different aspects of development of a firm through time, with special reference to the forms and rates of development of the Swastik Rubber Products Limited, Kirkee. University of Poona.

2. Harlalka, Shyam Sunder. Socio-economic study of tea garden labourers of Assam. University of Gauhati.

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1. Bora, Arjun Das. A philosophical study of the yoga sutra of Patanjali. University of Poona.

2. Sharma, Ram Nath. The social philosophy of Sri Aurobindo. D.Litt. Meerut University.

3. Srirama, Raju Alluri. Modern Indian humanism: A study with reference to the works of Raja Ram Mohan Roy, Swami Vivekananda, Rabindranath Tagore, S. Radhakrishnan and M.N. Roy. Andhra University.

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1. Dhongde, Ramesh Vaman. Tense, aspect and mood in English and Marathi. University of Poona.

2. Tolani, Sundri Thakurdas. Contemporary standard Sindhi: A transformational generative sketch. University of Poona.

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English

1. Akhauri, Brajnandan Prasad. Images and symbols in the poetry of Sri Aurobindo. Magadh University.

2. Kadam, Anand Arjun. John Galsworthy: A thematic study of his plays. Shivaji University.

3. Togale, Dattatraya Vithoba. Structure in the novels of Virginia Woolf. Shivaji University.

Sanskrit

1. Bhat, Vishnu Prasad. A critical and comparative study of the Brahadaranyaka Upanishad. University of Poona.

2. Chaturvedi, Mahesh Nath. Mahakavi Kalidas ke natakon ki darshnik prishtbhumi: Ek vivechan. Kanpur University.

3. Jeste, Meena Deodatta. Arts in the Puranas. University of Poona.

4. Jha, Kishore Nath. Nyay drishtyatmanuchintanam. D.Litt. K.S. Darbhanga Sanskrit University.

5. Sudhi, Padma. Indian aesthetic theories in Sanskrit literature: From Veda to classical period upto the age of Kalidasa. University of Poona.

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1. Bajpai, Radhey Shyam. Hindi radio natak: Premna strot, uplabdhiyan evam seemayen. Kanpur University.

2. Chauhan, Shatrughan Dass. Swatantratakaleen Hindi upanyas mein nayak ka swarup. Kanpur University.

3. Gupta, Kamla Devi. Prem Chand tatha Shart ke nari patron ka tulnatmak adhyayan. Kanpur University.

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5. Kulkarni, Govind Pandharinath. Kavivar Smayasunder ke charit evam akhyen kavya, 1615-1703. University of Poona.

6. Kulkarni, Govind Ramkrishna. Bisvin sadi ke Pauranik Hindi prabandh kavya aur adhunikta. University of Poona.

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basik Marathi natakteel vyaktirekhatan: 1883-1970 madhil mahatvachya vyaktirekhanche viche. Shivaji University.

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CLASSIFIED ADVERTISEMENTS

UNIVERSITY OF DELHI

Advt. No. Estab. IV/23/74

APPLICATIONS in the prescribed form are invited for the following posts:—

3. For Lecturership

Good academic record with first or high Second Class Master's Degree or an equivalent Degree of a Foreign University in the subject concerned.

S. No.	Department	Designation
1.	Chemistry	Professor (One)
2.	Urdu	Reader (One)
3.	Physics & Astro-Physics	Readers (One Permanent and Two temporary : one upto July 1975 and the other upto April 1976.)
4.	Zoology	Reader (One) Research Associate (One).
5.	Faculty of Music & Fine Arts	Lecturer in Hindustani Music (One). Part-time Tutors (2 Vocal and 2 Instrumental)
6.	Central Office	(i) Deputy Controller of Exams. (One). (ii) Asstt. Director of Physical Education (One Male & One Female). (iii) Receptionist (One) (iv) Steno-typists (English).

The scale of pay of the posts are:

1. Professor: Rs. 1100-50-1300-60-1600.
 2. Reader: Rs. 700-50-1250.
 3. Lecturer/Research Associate: Rs. 400-40-800-50-950.
 4. Part-time Tutors: Rs. 300/- to 500/- (Fixed) depending upon the qualifications and experience.
 5. Deputy Controller of Exams: Rs. 700-50-1250.
 6. Asstt. Director of Physical Education: Rs. 400-40-800-50-950.
 7. Receptionist: Rs. 425-15-500-EB-15-560-20-700 (Revised).
 8. Steno-typists (English): Rs. 330-10-380-EB-12-500-EB-15-560 (Revised).
- All posts carry D.A., C.C.A., H.R.A. and retirement benefits (in case of permanent incumbents) as admissible under the rules in force from time to time. The above pay scales in respect of posts at Sl. Nos. 1-6 are likely to be revised.

I. ESSENTIAL QUALIFICATIONS

1. For Professorship:

A Scholar of eminence. Independent published work of high standard and experience of teaching Postgraduate classes and guiding research for a considerable period desirable.

2. For Readership:

Good academic record with first or high Second Class Master's Degree in the subject concerned with a Doctoral Degree or equivalent published work.

Independent published work (in addition to the published work mentioned above) with at least 5 years' teaching experience in Honours/Postgraduate Classes essential.

4. For Research Associate:

Good academic record with first or high Second Class Master's Degree in Zoology and/or Bio-chemistry followed by Doctoral Degree or equivalent research work.

5. For Part-time Tutors in Hindustani Music:

Good academic record with first or high Second Class Master's Degree in Music and proficiency in performance.

6. For Deputy Controller of Exams:

Second Class Master's Degree and experience of educational administration at the executive level for at least 8 years.

7. For Asstt. Director of Physical Education:

Master's Degree in Physical Education or a Master's Degree in Arts/Science with a Post-graduate Diploma in Physical Education.

8. For Receptionist:

At least a Graduate with sound knowledge of English. Should be a good conversationist both in English and Hindi. Experience of working in an educational institution preferred.

9. For Steno-typists (English):

Matriculate with proficiency in Typewriting (minimum speed 35 w.p.m.) and proficiency in Short-hand (minimum speed 80 w.p.m.). Candidates will be required to appear and qualify in tests to be held by the University in General English, Short-hand and Typewriting.

II. SPECIAL/DESIRABLE QUALIFICATIONS :

1. For Professorship in Physical or Inorganic Chemistry:

Specialisation and research experience in any of the following areas:

Electrochemistry, Polymer Chemistry, Radiation Chemistry, Chemical Spectroscopy, Theoretical Quantum Chemistry, Chemical Thermodynamics including Statistical Thermodynamics, X-ray Crystallography, Chemical Kinetics.

Specialisation in Inorganic Chemistry and Research experience in any of the following areas:

Coordination Chemistry, Analytical Chemistry, Radiation Chemistry.

2. For Readership in Physics & Astro-Physics:

Specialization in Solid State Physics, Nuclear and High Energy Physics, Spectroscopy, Plasma and Astrophysics, Particle Physics and Field Theory, Statistical Physics and Many Body Theory.

3. For Readership in Urdu :

Ability (i) to guide research at M. Litt. and Ph.D. levels; (ii) to conduct Post-M.A. specialised courses in translation and M.Litt. in Urdu. Special study of Nineteenth Century Urdu Prose.

4. For Readership in Zoology:

Specialisation in Cell Biology, Endocrinology, Fishery Biology, Entomology, Ecology, Genetics.

5. For Research Associate in Zoology :

Specialization in Endocrinology, Entomology, Cell Biology and Fishery Biology.

6. For Lecturership in Hindustani Music:

Experience of teaching Degree Classes for not less than two years. Evidence of published work. Working knowledge of any three of the following languages:

Sanskrit, English, Hindi, Urdu, Bengali and Marathi.

7. For Deputy Controller of Examinations:

Experience of University administration, familiarity with the working of the University bodies and Institutions and relating to conduct and confidential work of examinations.

8. For Asstt. Director of Physical Education:

Should have previous administrative experience of organising games and sports at University level. Proficiency

in games upto Inter-University and National level.

The prescribed application form can be had from the Information Office of the University either personally or by sending a self-addressed envelope (5" x 11") with postage stamps worth Rs. 1.75.

Selected candidates will have to produce the original documents relating to their age, qualifications, experience, etc. before joining the appointment.

Applications accompanied by attested copies of Degrees and other certificates, etc. should reach the undersigned not later than 16th July, 1974.

NOTE:

1. It will be open to the University to consider the names of suitable candidates who may not have applied. Relaxation of any of the qualifications may be made in exceptional cases in respect of all posts on the recommendations of the Selection Committee.
2. Convassing in any form by or on behalf of the candidate will disqualify.
3. Candidates for the posts at Sl. Nos. 1 to 5 called for interview from outside Delhi will be paid contribution towards Railway Fare as per rules.
4. Certain percentage of posts in the cadre of Steno-typists is reserved for Scheduled Caste, Scheduled Tribes and Ex-servicemen.

Sd/-
REGISTRAR

BANARAS HINDU UNIVERSITY

Admission Notice—1974-75.

THE Banaras Hindu University re-opens after Summer Vacation on July 9, 1974. The University offers the following Courses of Study in various Faculties, Institutes, Colleges, Schools. The prescribed admission forms and bulletin of information containing details of admission requirements and other relevant information can be had from the office of the Directors of the Institutes, Deans of the Faculties, Principals of the Colleges concerned on payment of Rs. 2/- (Cash/M.O./I.P.O.). Admission forms duly filled in are to be sent to the Heads of the Departments concerned for Post-graduate courses and to the Deans of the Faculties concerned for Under-graduate courses. All admissions are made strictly on merit basis.

Government / Endowment / University Scholarships, freeships and other financial assistance are available for meritorious and deserving students. Nearly 160 Research Scholarships/Fellowships of the value of Rs. 250/- p.m. and Rs. 300/- p.m. respectively are awarded every year by the University. About 270 U.G.C./C.S.I.R. Scholarships and Fellowships of the value ranging from Rs. 300/- p.m.

to Rs. 500/- p.m. are also offered to the Research Scholars. Each student admitted to Post-graduate course within the sanctioned quota in the Institute of Technology is paid a stipend of Rs. 250 p.m. Other facilities viz., Hostel accommodation (for Boys and Girls), Bus, Text Book Bank etc., also exist.

The prospectus of studies for each course can be had from the Public Relations Officer of the University on payment of the prescribed price.

Separate application form is required to be filled in for each course.

The issue of admission application forms for various courses in the different Faculties, shall stop before one week from the date fixed for the submission of the same.

I.P.Os, M.O.s drawn in favour of the Deans of the respective Faculties and the Principals of the Colleges, payable at the B.H.U. Post Office, should reach the Offices concerned on or before the date specified above.

1. FACULTY OF ARTS

COURSES AVAILABLE:

1. M.A. in A.I.H.C. & Archaeology, Arabic, Bengali, English, German, Geography, Art & Architecture (History of Art), Hindi, Indian Philosophy & Religion, Mathematics, Pali, Philosophy, Persian, Sanskrit, Statistics, and Urdu.

ELIGIBILITY REQUIREMENT: B.A. or equivalent examination.

2. B.A. (three-year degree course)

ELIGIBILITY REQUIREMENTS:

Candidates who have passed P.U.C. exam or its equivalent are eligible for admission to B.A. Part I and those who have passed I.A. examination or its equivalent are eligible for B.A. Part II class.

3. B. Library Science Courses:

ELIGIBILITY REQUIREMENT:

A Second Class Bachelor's degree of a recognised University. A limited number of seats are reserved for the deputed candidates and working Librarians of long standing.

4. M. Library Science Courses:

Eligibility Requirements:

A Second Class B. Lib. Sc. degree or a post-graduate Diploma in Library Science from a recognised University.

5. Post-Graduate Diploma in:

- (a) Linguistics and
- (b) Journalism (Full time)

ELIGIBILITY REQUIREMENTS:

B.A. or equivalent examination.

6. B.P. Ed. Course:

ELIGIBILITY REQUIREMENTS:

Bachelor's degree of a recognised University with aptitude for games & sports, gymnastics and aquatics etc.

NOTE: Admissions to the B. Lib. Sc. and M. Lib. Sc., Physical Education (B.P. Ed.), Diploma in Journalism courses will be made after Admission Test/Interview.

THE LAST DATE FOR THE SUBMISSION OF THE FORM IS 16-8-74.

2. FACULTY OF SCIENCE

COURSES AVAILABLE:

1. M.Sc. Two years course in Physics, Chemistry, Botany, Zoology, Geography, Geology, Geophysics, Mathematics, Statistics, Bio-Chemistry and Psychology.

ELIGIBILITY REQUIREMENTS:

B.Sc. Hons. or B.Sc. with the subjects to be offered in M.Sc. **ADDITIONAL** subject required for admission to:

M.Sc. Chemistry—B.Sc. with Physics, Chem, Maths.

M.Sc. Botany—B.Sc. with Botany and Chemistry.

M.Sc. Geophysics—B.Sc. with Geology, Physics and Mathematics

M.Sc. Zoology—B.Sc. with Chemistry and Zoology.

M.Sc. Bio-Chemistry—B.Sc. with Chemistry (not subsidiary or minor) with any two of the following subjects:—

Physics, Maths, Botany, Zoology, Physiology, Bio-Chemistry.

2. B.Sc. (Three Year Degree Course) Part I:

ELIGIBILITY REQUIREMENT:

P.U.C., Higher Secondary or equivalent Examination with Science, I.Sc. passed students may also apply.

3. B.Sc. Part II:

Eligibility Requirements:

I.Sc. or equivalent examination in Science with atleast one of the subjects of the Group.

4. Two Years B.Sc. Hons. Course:

Those admitted in B.Sc. Part II may take Hons. in one of the 3 subjects provided they have secured 50% marks in the subject and 48% in aggregate. English will be compulsory for Honours Course.

NOTE: Girls desirous of offering combinations with subjects other than Geology and Statistics should apply to the Principal, Women's College for forms and admission. Those who are desirous of offering Hons. Course in B.Sc. Part II and desire to study in the main Deptts. of the Faculty may apply direct to the Dean's office.

LAST DATE for submission of applications is 21st August, 1974.

3. FACULTY OF SOCIAL SCIENCES COURSES AVAILABLE: Post-graduate and Under-graduate Courses in the following subjects:

1. Economics, 2. History, 3. Political Science, 4. Psychology, 5. Sociology.

Students seeking admission to B.A. Part I and Part II have the option to offer two or three optional subjects of the above mentioned five subjects besides one compulsory language paper.

ELIGIBILITY REQUIREMENTS:

I. M.A.: B.A. or its equivalent examination of a recognised University.

II. B.A. Part I.: P.U.C./Higher Secondary or its equivalent examination.

III. B.A. Part II: Intermediate or its equivalent examination. THE LAST DATE for submission of applications is 16-8-74.

5. LAW SCHOOL

Courses Available:

- (i) LL.B. (6 Semesters-3 Yrs.)
- (ii) LL.M. (4 Semesters—2 Yrs.)

REQUIREMENTS FOR ADMISSION:

(i) LL.B.: Bachelor's degree or its equivalent degree.

(ii) LL.M.: Three years' LL.B. degree with at least 60% marks in the aggregate of various examinations comprising the LL.B. Degree, and proficiency in English.

LAST DATE for receipt of application forms in the Dean's office is 31st August 1974.

6. WOMEN'S COLLEGE

COURSES AVAILABLE:

- (i) B.A. & B.Sc. Part I
- (ii) B.A. & B.Sc. Part II (Pass and Honours)

ELIGIBILITY REQUIREMENTS:

Same as mentioned for B.A./B.Sc. Courses under the Faculties of Arts, Social Sciences and Science.

THE LAST DATE for receipt of applications in the office of the Principal for B.A./B.Sc. Courses are 16-8-74 and 21-8-74 respectively.

7. EVENING COLLEGE

COURSES AVAILABLE:

B.A. Part II in Hindi, English, History, Economics, Sociology and Political Science, etc.

ELIGIBILITY REQUIREMENT:

I.A./I. Sc./I.Com. or its equivalent examination.

THE LAST DATE for submission of admission application form is 14th August 1974.

8. FACULTY OF EDUCATION COURSES AVAILABLE:

- (i) B.Ed. (ii) M.Ed.

ELIGIBILITY REQUIREMENTS:

Bachelor's or Master's Degree. For M.Ed., a B.Ed. degree is also essential.

THE LAST DATE for submission of applications will be announced later on.

9. FACULTY OF MUSIC AND FINE ARTS

COURSES AVAILABLE:

1. Three Year B.Mus. Degree Course in Vocal/Instrumental Music.

2. Five Year B.Mus. (Hons.) Integrated Course in Vocal/Instrumental (Hindusthani Music) only.

ELIGIBILITY REQUIREMENTS:

High School or its equivalent exam.

3. Two Year M. Mus. Degree Course in Vocal/Instrumental/Musicology.

ELIGIBILITY REQUIREMENTS:

(i) B.Mus. of B.H.U. or equivalent Examination, or

(ii) B.A./B.A. (Hons.) with Music or its equivalent examination.

Admitted candidates shall be placed on one year's probation.

4. Two Year D. Mus. (Doctor of Music) Course in Vocal/Instrumental Music.

ESSENTIAL REQUIREMENTS:

M.Mus. of B.H.U. with 55% marks in practical or M.A. in Music from a recognised University with 60% marks in practical.

Admission will be made after Admission test. Admitted candidates shall be placed on one year's probation.

5. Three Year Diploma Course in Dance (Bharat Natyam): No educational qualification is prescribed for this course. Minimum age on 1st July, '74 should be 10 years.

THE LAST DATE for submission of

applications is 16-8-1974.

FINE ARTS UNIT:

1. The Fine Arts Unit admits students for the Five Years Integrated Course in Fine Arts for specialisation in Painting, Plastic Arts and Applied Arts separately leading to degree of Bachelor of Fine Arts (B.F.A.) in respective subjects;

First Year Integrated Course:

ELIGIBILITY REQUIREMENTS:

High School or its equivalent qualification. Admissions will be made on the basis of an aptitude test.

For direct admission to II Year Integrated course:

ELIGIBILITY REQUIREMENTS:

Intermediate or Higher Secondary with Drawing or Art.

For direct admission to III Year Painting: ELIGIBILITY REQUIREMENTS:

B.A. with Drawing and Painting or Painting as an optional subject or II Year Diploma examination in Painting.

2. M.F.A. Course in Painting/Applied Arts/Plastic Arts (2 Years duration):

ELIGIBILITY REQUIREMENTS:

B.F.A. degree

THE LAST DATE for receiving applications in the office of the Dean is 15th July, 1974.

NOTE: Details of the undergraduate and Post-graduate courses available in the Faculties of Agriculture, Commerce & Business Management and Oriental Learning & Theology will be notified separately. Admission notices for the Institute of Technology and the Institute of Medical Sciences have been released earlier.

Read & Advertise in University News

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY

POWAI, BOMBAY 400076

Research Scholarships/Fellowships in Sciences, Social Sciences and Humanities
1974-75 Session

Advertisement No. 779

RESEARCH Scholarships of the value of Rs. 300/- p.m. and Postdoctoral Fellowships of the value of Rs. 500/- p.m. are available in Chemistry, Geology, Humanities and Social Sciences, Mathematics and Physics.

Excellent facilities exist at the Institute for carrying out research in many of the modern disciplines in the respective departments. Application forms may be obtained from the Deputy Registrar (Academic) on request accompanied by a self-addressed stamped (60 paise stamp) envelope of size 28 x 13 cms. superscribed "Application for Research Scholarship/Fellowship in _____". Completed application

(Branch of Science)

forms accompanied by a crossed postal order for Rs. 5/- payable to the Indian Institute of Technology, Bombay, must reach the Deputy Registrar (Academic) by 14th August, 1974.

IN THE CASE OF CANDIDATES BELONGING TO SCHEDULED CASTE/TRIBE, SPECIAL CONSIDERATION WILL BE SHOWN IN THE MATTER OF ADMISSION.

Candidates have to appear for interview at the Institute before final selection. Candidates called for interview will be paid a single III class railway fare by the shortest route from the place of residence to the Institute and back.

MINIMUM QUALIFICATIONS:

A first class or high second class Master's Degree for research scholarship and Ph.D. degree for post-doctoral fellowship in the appropriate subjects.

Candidates who have appeared for the Master's Degree examination and are awaiting results are also eligible to apply.

The areas of specialisation are given below :

I. DEPARTMENT OF CHEMISTRY: 1. Solid State Chemistry and Physics, 2. Crystal and Molecular Structure; 3. Chemical and Mossbauer Spectroscopy, 4. Electrochemistry, 5. Thermodynamics, 6. Coordination Chemistry, 7. Analytical Chemistry 8. Chemistry of Natural Products, 9. Synthetic Organic Chemistry.

II. GEOLOGY: (Deptt. of Civil Engg.) 1. Petrology and Mineralogy, 2. Economic Geology, 3. Engineering Geology.

III. DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES: (A first class or high second class Bachelor's and Master's degree for Research Scholarship and Ph.D. degree for Post-doctoral Fellowship in the appropriate subjects).

1. English, 2. Economics, 3. Philosophy, 4. Behavioural Sciences (Psychology, Anthropology, Sociology, Management Science).

A candidate is required to submit a typed note of about 600 words outlining the proposed theme of research along with the application.

IV. DEPARTMENT OF MATHEMATICS: 1. Functional Analysis and Approximation Theory, 2. Complex Analysis, 3. Numerical Analysis, 4. Fluid Mechanics, 5. Elasticity, 6. Statistics.

V. DEPARTMENT OF PHYSICS: 1. Solid State Physics, Experimental and Theoretical, 2. Nuclear Physics, Experimental and Theoretical, 3. Atomic and Molecular Structure and Spectroscopy, 4. X-ray Spectroscopy and Crystallography.

Postal requests for application form, received without a self-addressed, adequately stamped and duly superscribed envelope of the appropriate size, or received after 7th August 1974 will not be entertained.

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY

POWAI, BOMBAY 400076

Research Scholarship/Fellowships in Engg./Tech.
1974-75 Session

Advertisement No. 780

RESEARCH Scholarships in Engineering/Technology of the value of Rs. 300/- p.m., Research Fellowships of the value of Rs. 400/- p.m. and post doctoral Fellow-

ships of the value of Rs. 500/- p.m. are available in the following Department of the Institute. Details of the Research facilities and programmes of the vari-

ous Departments will be available from Deputy Registrar (Academic).

Application forms may be obtained from the Deputy Registrar (Academic) on request accompanied by self-addressed stamped (60 paise) envelope of the size 28 x 13 cms. superscribed "APPLICATION FOR RESEARCH SCHOLARSHIP/FELLOWSHIP IN (Branch of Engineering)". Completed application forms accompanied by cross postal order for Rs. 5/- payable to the Indian Institute of Technology, Bombay, must reach him at the Institute by 14th August 1974.

In the case of candidates belonging to Scheduled Castes/Scheduled Tribes, special consideration will be shown in the matter of admission.

Candidates called for interview will be paid a single II class railway fare by the shortest route from the place of residence to the Institute and back.

The areas of research in which facilities are available and the minimum qualifications required are given below:—

1. AERONAUTICAL ENGINEERING:

(1) AERODYNAMICS

- (a) Boundary Layers on Curved Surfaces
- (b) Separated Flows
- (c) Jet Interaction with Bodies.

(2) PROPULSION

- (a) Aerothermodynamics
- (b) Performance of Turbomachines
- (c) Engine Cooling and Heat-transfer Studies
- (d) Combustion-Flame-Stabilization and Fuel Additives
- (e) Vibrations of High Speed Rotors.

(3) AIRCRAFT STRUCTURES

- (a) Finite Element Methods
- (b) Composites
- (c) Structural Dynamics.

(4) AIRCRAFT SYSTEMS

2. **CHEMICAL ENGINEERING:** (1) Automation in Chemical Industries, (2) Inorganic Process Industries, (3) Organic Process Industries, (4) Technology of Fuels, (5) Technology of Silicates, (6) Unit Operations, (7) Optimization and Simulation.

3. **CIVIL ENGINEERING:** (a) Hydraulic Engg.: (1) Theoretical Fluid Mechanics, (2) Groundwater Flow, (3) Free Surface Flow. (b) Soil Engg.: (1) Basic Soil Mechanics, (2) Soil Stabilization, (3) Foundation Interaction Problems and Earth Dam Problems, (4) Dynamics of Soil Media, (5) Mechanics of Swelling

Soil Media, (6) Rock Mechanics, (c) Structural Engineering: (1) Materials of construction, (2) Static and Dynamic problems in framed and grid structures (buildings, bridges etc.) and thin walled structures (plates and shells used in pressure vessels and other complex structures) (3) Systems analysis and probabilistic design, (4) Optimization, (5) Numerical methods and computer programming, (6) Biomechanics.

4. ELECTRICAL ENGINEERING (INCLUDING ELECTRONICS):

1. Rotating Machines, 2. Power systems protection, 3. Control systems, 4. Instrumentation (integrated circuits), 5. Solid State Microwave Devices and Integrated Circuits, 6. Microwave Engineering, 7. Communication Theory and systems, 8. Thin Film Technology, 9. Computer Systems.

5. **MECHANICAL ENGINEERING:** 1. Machine tool and Metal cutting, 2. I.C. Engineering, 3. Fluid Mechanics and Fluid Machinery, 4. Thermodynamics and Heat Transfer, 5. Refrigeration and Airconditioning, 6. Metal Casting and Metal Forming.

6. **METALLURGICAL ENGINEERING:** 1. Phase Transformations, 2. Fracture Mechanics, (3) Diffusion and Sintering, (4) Thermodynamics of Metallurgical processes, (5) Extraction of ferrous and non-ferrous metals, (6) Raw materials preparation.

MINIMUM QUALIFICATIONS:

(i) A good Bachelor's degree in appropriate branch of Engineering for Research Scholarship of Rs. 250/- p.m. for research scholarships in Department of Chemical, Electrical or Metallurgical Engineering, candidates with a good Master's degree in Mathematics, Physics, Chemistry will also be eligible. Candidates with a Master's degree in Chemical Technology are also eligible for research scholarships in some fields in Chemical Engineering.

All Research Scholars holding Bachelor's degree in Engineering starting with Rs. 250/- p.m. will be eligible for consideration for Research Scholarship on Rs. 400/ p.m. after two years' study/research.

(ii) A good Master's degree in appropriate branch of Engineering/ Technology for Research Fellowship of Rs. 400/- p.m.

(iii) A Ph.D. degree in appropriate branch of Engineering/Technology for post-doctoral fellowship of Rs. 500/- p.m.

Candidates who have appeared at a qualifying examination and are awaiting results are also eligible to apply.

Postal requests for application form received without a self-addressed, adequately stamped and duly superscribed envelope of the appropriate size, or received after 7th August, 1974 will not be entertained.

CLASSIFIED ADVERTISEMENTS

THE UNIVERSITY OF KASHMIR

University Campus,
Hazratbal, Srinagar-6

NOTICE

APPLICATIONS to reach the undersigned by July 20, 1974 are invited for the following posts:—

For details and prescribed application forms please apply sending crossed postal order for Rs. 6/- (Rupees six only) (cashable at the Srinagar Post Office) in favour of the Registrar, University of Kashmir, Srinagar

(M.A. Chishti)
REGISTRAR

Post	Grade
1. Professors in (History) Law and Education.	Rs. 1100-50-1300-60-1600.
2. Readers in Zoology, Mathematics, Economics, Political Science, History and Urdu.	Rs. 700-50-1250.
3. Lecturers in Economics (temporary), Zoology, Chemistry, Persian and Mathematics.	Rs. 400-40-800-EB-50-950

BERHAMPUR UNIVERSITY
BHANJA BIHAR, BERHAMPUR-7,
(GANJAM)

No. 4701/Admr./B&B/74

Dated the 8th June, 1974.

ADVERTISEMENT

APPLICATIONS are invited for the following Teaching posts for the Post-Graduate Departments of this University.

(ii) Shall possess a first or second class Master's Degree (with at least 48% marks) in the subject.

(iii) Shall have a doctorate degree or published work of equivalent standard.

(iv) Shall be engaged in active Research and shall have experience in guiding research.

(v) Shall have teaching experience in

Sl. No.	Subject	Vacant posts	No. of vacancies
1.	English	Professor	One
		Lecturer	One
2.	Marine Biology	Professor	One
		Lecturer	One
3.	Chemistry	Reader	One

Proposed P. G.
Dep'ts.

Scales of pay

(i) Professor:—Rs. 1100-50-1300-60-1600/-.

(ii) Reader:—Rs. 700-50-1250/-.

(iii) Lecturer:—Rs. 400-40-800-50-950/-.

Plus usual allowances as admissible by the University from time to time.

PROFESSOR

Qualification and Experiences:—

(i) Shall be a scholar of eminence.

a college or a University teaching department for at least ten years in the subject of which at least three years shall be in the Post Graduate Classes.

QUALIFICATION AND EXPERIENCE

For the post of Reader in Chemistry.

The candidate shall have:—

(i) A first or Second class Master's Degree (with at least 48% marks) in the subject.

(ii) A doctorate degree or published work of equivalent standard.

(iii) Teaching experience in a college or in a University department for at least 8 years in the subject of which 2 years preferably be in P.G. Classes.

(iv) Capacity to guide research shall be regarded as an additional qualification.

Qualification for the Post of Lecturer

The candidate shall have a first or second class Master's degree (with at least 48% marks) in the subject.

Specialisation

1. English

(a) Professor:—Candidates shall have specialisation in comparative Literature both foreign and Indian.

(b) Lecturer:—Candidates shall have specialisation in applied Linguistics.

2. Marine Biology

Candidates having M.Sc. in Oceanography or Zoology or Biological sciences having specialisation in fisheries may also apply.

Seven copies of the prescribed application forms will be supplied to the candidates from the office of the undersigned on payment of Rs. 1.50 paise in person or by Bank Draft drawn on the State Bank of India or by Money order in favour of the Registrar, Berhampur University, Bhanja Bihar, Berhampur-7 along with a self-addressed envelope measuring 22 x 10 cms affixed with postage stamps worth of 0.85 paise.

The applications duly filled in along with attested true copies of certificates, testimonials and publications etc., should reach the undersigned on or before 15th July, 1974. Applications received after the due date will not be entertained.

Candidates who are in service should apply through proper channels.

Persons in Govt. service selected for appointment shall be allowed leave salary and pension contribution for one year only if they wish to retain their lien under Government.

The prescribed period of experience for the posts will be calculated up to the last date fixed for the receipt of the application.

Sd/-
REGISTRAR



Fly with your flag.

Remember the joy when you first saw your flag being hoisted. As if your heart would take wing, as if it would flutter in the wind along with the flag.

And remember how proud you were because it gave you a place, a unique place, among other flags, other countries, other peoples.

So also today, your flag flies for everything distinctively yours, distinctively Indian. Air-India is your country's flag-carrier. It carries your country's history,

heritage, hospitality.

You'll discover Air-India speaks the same language as you do in the air and on ground. You'll get the sort of food, service, style to which you are accustomed. And you'll find that Air-India understands you like no other airline can.

Next time you fly, remember your country's airline. Air-India knows what it means to be an Indian, what it takes to make an Indian smile.

Be an Air-Indian. Fly Air-India.

Association of Indian Universities Publication

University News

CHRONICLE OF HIGHER EDUCATION & RESEARCH

★ August 1974

Re. 1.25



Prime Minister Indira Gandhi addressing the Vice-Chancellors of
Agricultural Universities in New Delhi.

ANDHRA UNIVERSITY

APPLICATIONS in the prescribed form are invited for the following posts so as to reach the Registrar, Andhra University, Waltair, on or before **12-8-1974**. Each application shall be accompanied by a crossed Indian Postal Order for Rs. 10/- or a Bank receipt remitting the amount in the State Bank of India towards Registration fee of the application.

Subject	Professor	Reader	Lecturer
1	2	3	4
1. History & Archaeology	1	—	1
2. Commerce	—	—	1
3. English	—	1	1
		(Temporary)	
4. Sociology/Social Work	1	—	1
5. Geology	—	2	1
6. Physics	—	2	—
7. Nuclear Physics	1	—	—
	(Temporary)		
8. Applied Mathematics	—	1	3
9. Chemistry	—	—	1
			(Temporary)
10. Human Genetics and Physical Anthropology	—	1	—
11. Physical Anthropology	—	1	—
12. Pharmacy	—	4	—
13. Civil Engineering	1	—	—
	(Temporary)		
14. Mechanical Engineering	1	3	1
15. Electronics and Communication Engineering	—	1	1

Scale of pay:

Professor: Rs. 1,100-50-1,300-60-1600
 Reader: Rs. 700-50-1,250
 Lecturer: Rs. 400-40-00-50-950

Scale of pay

16. Senior Research Fellow in Geology	1	Rs. 500/- P.M. fixed
17. Junior Research Fellows in Botany	4	Rs 300/- P.M. fixed
18. Laboratory Technician, Dispensary	1	Rs. 100-7-180-9-225
19. Sanitary Inspector	1	
20. U.D. Stenographers	2	Rs. 140-9-230-230-280 plus Soht Hand and typewriting allowance.
21. Plant Breeding Assistant	1	Rs. 250-15-400-20-500
22. Laboratory Technician, Botany	1	Rs. 160-10-260-320
23. Museum Keeper, Geology	1	

NOTE:

The rule of reservation of appointment for Scheduled Caste and Scheduled Tribe candidates is applicable for the posts from 1 to 17 and for candidates of Scheduled Caste, Scheduled Tribe and Backward class for posts from 18 to 23.

Requisitions for the application forms and other details of qualifications and age etc., prescribed for the posts may be made to Sri P. Hanumantha Rao, Deputy Registrar, Andhra University, Waltair, accompanied by a self-addressed and stamped envelope and a State Bank challan or a Crossed Indian Postal Order for one rupee. The University reserves the right to fill or not to fill the posts. The cover containing the applications should be superscribed as "Application for appointment to the post of....."

Sd/-M. Gopalakrishna Reddy
REGISTRAR

UNIVERSITY OF JODHPUR

(Establishment Branch)

Advertisement No. 4/74

APPLICATIONS to reach the undersigned by **August 19, 1974**, are invited for the following posts:—

1. Professors in Philosophy and Geography: Scale: Rs. 1100-50-1600-100-1800.

2. Readers in English, Economics, Commerce, Political Science, Botany, Zoology, Chemistry, Philosophy, Law, Civil Engineering, Structural Engineering, Mining Engineering & Mechanical Engineering: Scale: Rs. 700-50-1250.

3. Lecturers in English, Hindi Sanskrit, Political Sciences, Sociology, Philosophy, Home Science, Comparative Literature and Language Studies, Music, Commerce, Law, Zoology, Geography, Statistics, French, Electrical Engineering, Civil Engineering, Structural Engineering (Architecture), Mining Engineering, Electronics and Mechanical Engineering: Scale: Rs. 400-40-800-50-950.

4. Research Assistants in Hindi, Chemistry, Zoology, Political Science and Economics: Scale: Rs. 300-25-350.

5. Librarian: Scale: Rs. 1100-50-1600-100-1800.

6. Branch Librarian in Engineering: Scale: Rs. 375-25-550-30-850.

7. Professional Assistant in Library: Scale: Rs. 250-20-450-25-625.

8. Junior Technical Assistant: Scale: Rs. 160-8-200-10-240-15-360.

9. Assistant Engineer (Electrical): Scale: Rs. 375-25-550-30-850.

10. Mechanic: Scale: Rs. 200-15-350-20-450.

11. Head Draftsman: Scale: Rs. 180-10-220-15-380-20-425.

12. Overseer: Scale: 180-10-220-15-380-20-425.

13. Draftsman (Electrical): Scale: Rs. 130-8-170-10-210-15-300.

14. Senior Technician in Mechanical Engineering: Scale: Rs. 180-10-220-15-380-20-425.

15. Technician (High Voltage): Scale: 110-5-160-8-200-10-230.

16. Stenographers: Scale: 170-10-210-15-390.

17. Proof Reader: Scale: Rs. 150-8-190-10-210-15-330.

18. Trained Nurse: Scale: Rs. 110-5-160-8-200-10-230.

19. Drivers: Scale: Rs. 110-5-160-8-200-10-230.

Posts carry allowances and other benefits as may be admissible under the rules of the University from time to time.

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UNIVERSITY NEWS

Vol. XII
No. 8



AUGUST
1974

A Monthly Chronicle of Higher Education

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Opinions expressed in the articles and reviews are individual and do not necessarily reflect the policies of the Association.

Editor : ANJNI KUMAR

Agriculture Vice-Chancellors Meet the Prime Minister

A two-day conference of Vice-Chancellors of Agricultural Universities was held recently in Krishi Bhavan, New Delhi. At the end of the conference the Vice-Chancellors met the Prime Minister and submitted a memorandum setting out the programmes that the universities could take up immediately to *assist the Government in increasing food production*. They offered to mobilise their students and staff members to produce and distribute literature in local languages about steps to be taken to improve the crop yields. It was also suggested that technical inputs could be provided through the university personnel in collaboration with the State Agriculture Departments to achieve widespread transfer of modern technology reforms. In this connection the Vice-Chancellors suggested that immediate action should be taken to ensure that the totality of research responsibilities of agricultural and allied subjects be transferred to the agricultural universities. The collaboration between the State Agriculture Departments and the Agricultural Universities should be institutionalised through a suitable memoranda of understanding so that the two could function in a coordinated way.

With regard to the policy matters effecting the agricultural production, the Vice-Chancellors felt that the model act drafted by the Indian Council of Agricultural Research for setting up an agricultural university should be implemented by all States to help matters. They urged that in future all matters effecting agricultural production and development be brought to the notice of policy makers both at the Centre and in the States at the initial stages. In fulfilling the objectives stated above the Vice-Chancellors said that they could immediately undertake to produce nucleus seeds for augmenting the kharif and the coming rabi production programmes to meet the shortage of seed varieties. From these seeds foundations and certified seeds could be produced by National Seeds Corporation and the State Agro-Services Corporation. Wherever facilities exist with the universities they will also undertake to produce seeds. A suggestion was also made that the assistance should be given to the universities to design their own radio and television services which could operate on an allocated wave-length on the conditions that they would give news and features relevant to farming. The Agriculture Minister suggested that each university should frame a definite programme for its area of operation for implementation during the kharif and rabi seasons.

The Prime Minister in her address to the Vice-Chancellors said that the farmers should be imparted education not only on improved agricultural technology but also on other aspects of rural life. She called for a fresh approach to the development of the rural areas and urged that the rural youths should be fully involved in all the development programmes. The real improvement in agriculture and rural development could be brought about only by involving the farmers. She also observed that there was a tendency among the farmers to shift to more remunerative crops depending on the fluctuations in prices. The ways and means should be found to avoid this to bring about stability in crop production.

Economics of University of Delhi

H. N. Pandit

THERE were 1.25 lakh students enrolled in graduate and post-graduate courses in the University of Delhi on 31st March, 1974. 61 per cent of them were regular students, 4 per cent were non-collegiate woman students, 11 per cent were registered in correspondence courses and 24 per cent were registered with the External Cell as private students. This rapid growth in student population may be seen against the total enrolment of only twenty two thousands in 1961-62. The non-collegiate women's education programme, correspondence courses and permission to appear as private students in the university examination are the major developments of 1960s. The number of colleges increased from 22 in 1961-62 to 39 in 1971-72. The average size of a college rose from 830 to 1,279 during the same period. It is further observed that growth of undergraduate and postgraduate courses has not been uniform during the last 14 years. Enrolment of regular students in undergraduate courses became 6.5 times and that of the postgraduate courses became 2.8 times in 1971-72 as compared to 1961-62. The total expenditure of the university departments, constituent and affiliated colleges put together amounted to only Rs. 74 lakhs in 1950-51 and it rose to Rs. 8 crores in 1968-69.

During the last 14 years there have been substantial changes in structure of the university. The enrolment in the undergraduate courses constituted 78.62 per cent of the total enrolment in 1961-62 and it increased to 89.43 per cent in 1973-74. If we exclude the enrolment in correspondence courses, non-collegiate education board and external cell, the position of the enrolment in the undergraduate courses in relation to the total enrolment improved from 78.7 to 83.42 per cent during the same period.

Change in Sex

In 1961-62, the student community both at the undergraduate and postgraduate levels was more male dominated but the position in 1973-74 changed considerably in favour of female students. The female participation rate during 1961-62 to 1973-74

among the regular students at the undergraduate and postgraduate level put together has improved from 35 to 39 per cent—37 to 40 per cent at the undergraduate level and 26 to 32 per cent at the postgraduate level. Thus, there are clear indications that the faster growth in female student enrolment is going to reduce the male student domination in the university student community during the next few years. This change in composition of student community has to be taken into consideration by the university authorities for planning curricular and co-curricular activities in the university.

Changes in Speciality-mix

The decennial changes in the enrolment by the speciality-mix may be noted at the undergraduate and postgraduate levels from Table 1.

TABLE I

Growing and Declining Specialisations at the Undergraduate and Postgraduate levels, 1964-65 and 1972-73

S. No.	Specialisation	Undergraduate Level		Post graduate Level	
		1964-65	1972-73	1964-65	1972-73
0	1	2	3	4	5
1.	Arts	62.6	52.8	29.4	20.0
2.	Social Sciences	13.7	26.0	26.1	18.1
3.	Science	13.4	14.1	10.2	13.3
4.	Mathematics	2.6	1.6	10.0	6.8
5.	Music	0.4	0.6	0.3	0.4
6.	Technology	3.1	2.0	0.4	0.2
7.	Medical Science	4.2	2.9	5.4	5.5
8.	Education	—	—	4.6	2.3
9.	Law	—	—	14.0	26.1
10.	Management Studies	—	—	—	7.3
11.	Total	100.0	100.0	100.0	100.0

It is seen that the Social Sciences, Science, Music at the undergraduate level and Law, Science, Medicine and Music at the postgraduate level have become more popular during 1964-65 to 1972-73. The share of Arts, Technology, Medical Science and Mathematics at the Undergraduate level and Arts, Social Science, Mathematics at the postgraduate level have shown a declining trend.

*Author is Professor in N.C.E.R.T.

Female-Faculty Participation

Faculty-wise female participation rates in the undergraduate Honours and post-graduate levels have been shown in Table 2.

TABLE 2

Female-Faculty Participation Rates at the Undergraduate Honours and Postgraduate levels, 1964-65 and 1972-73

S. No.	Faculty	1964-65	1972-73
0	1	2	3
1. Undergraduate Honours Level			
(a) Arts		75.7	85.0
(b) Social Science		22.4	30.9
(c) Medical Science, Technology and Music		37.8	34.4
2. Postgraduate Level			
(a) Arts		48.0	63.7
(b) Mathematics, Music and Medical Science		26.9	33.6
(c) Science		41.7	31.0
(d) Social Sciences		30.8	27.8
(e) Law, Education and Technology		19.0	10.7

It is observed that female-faculty participation rates have gone up in subject areas falling under Arts and Social Sciences at the undergraduate Honours level and those falling under the Faculties of Arts and Mathematics, Music and Medical Sciences at the postgraduate level.

Further, a subjectwise analysis of study reveals that even in 1972-73 Bengali, English, Hindi, Punjabi, Philosophy, Sanskrit, Urdu, History, Human Geography, Political Science, and Sociology at the undergraduate Honours and postgraduate levels were predominantly popular with female students. At the postgraduate level subjects like Anthropology, Botany, Home Science, Nursing, Music, B.Ed and B.Lib. Sc. were very popular with female students.

Budgetary Trends

Changes in income and expenditure position of the University of Delhi as a whole may be seen from Table 3.

While presenting data in the table, the three yearly average figures have been presented centered against the years falling in the Three Five Year Plans and actual figures have been shown against base year 1950-51 and last year 1966-67. It is observed that the University as a whole, has been showing surpluses from 1961-62. The growth in expenditure and income has been going hand in hand during the last 18 years covered in the table.

Structural Changes

Table 4 (on page 6) gives structural changes in the expenditure of Delhi University and all universities taken together.

While presenting data in the table, the percentage distributions of expenditure according to functional categories have been worked out on the basis of tri-annual average expenditure figures centered around 1955-56 and 1964-65. It is observed that the capital expenditure in relation to the total expenditure has gone down from 25 per cent in 1955-56 to 9.8 per cent in 1964-65. Against this, the capital expenditure for all universities has shown an upward increase from 20 to 22.4 per cent during the decade covered in the table. With respect to the Delhi University there has been a great increase in the share of salaries of teaching and non-teaching staff from 45.4 per cent to 54.9 per cent during the decade.

TABLE 3

Growth in Income and Expenditure of University of Delhi, 1950-51 to 1966-67

(Amount in Lakhs of Rs.)

S. No.	Year	Income	Expenditure	Difference
0	1	2	3	4
1.	1950-51	74.35	74.13	+1.22
2.	1952-53	96.81	100.36	-3.55
3.	1955-56	145.48	149.83	-4.35
4.	1958-59	192.41	198.00	-5.59
5.	1961-62	416.86	335.73	+81.13
6.	1964-65	424.28	420.00	+4.28
7.	1966-67	573.38	559.38	+14.00
8.	Annual Growth Rate	13.5	13.5	

There has been an increase of about 7.6 percentage points in the share of salaries paid to teaching staff as compared to 2 percentage points in the share of non-teaching staff. As against this, it is observed that the salaries' share in the total expenditure, in fact, has gone down from 42.8 to 42 per cent during the decade. Further, the share of salaries of the teaching staff of the Delhi University was lower as compared to the corresponding share of the teaching staff salaries in all universities taken together in 1955-56, and it has shown a substantial improvement as compared to all universities, where it has remained static during the decade. Further, the share of salaries of non-teaching staff in the Delhi University as compared to the all universities was initially higher by 4 percentage points in 1955-56 and it became 6 percentage points higher in 1964-65. Interestingly, the share of scholarships and stipends has moved up with respect to all universities from 7.4 to 9.8 per cent but it has remained constant at 5 per cent for the university of Delhi. The University of Delhi seems to have an edge over all universities put together with respect to the expenditure on examinations. The share of expenditure on examinations has decreased during the decade

TABLE 4

Structural changes in the Expenditure pattern of the Delhi University and all Universities, 1955-56 and 1964-65

S. No.	Sector	Delhi University		All Universities	
		1955-56	1964-65	1955-56	1964-65
0	1	2	3	4	5
1.	Salaries	45.41	54.89	42.79	41.96
	(a) Teaching Staff	30.29	37.89	31.50	30.85
	(b) Non-Teaching Staff	15.12	17.00	11.29	11.11
2.	Scholarships and Stipends	5.10	5.36	7.43	9.81
3.	Examination	1.96	1.69	4.23	3.29
4.	Games and Sports	0.82	0.67	1.04	0.58
5.	Hostels	0.85	1.71	2.11	1.30
6.	Library	1.85	5.79	1.71	3.75
	(a) Capital Expenditure	—	1.23	—	1.39
	(b) Current Expenditure	1.85	4.56	1.71	2.36
7.	Building	19.84	7.30	11.23	13.95
	(a) Capital Expenditure	17.14	5.27	9.45	13.06
	(b) Current Expenditure	2.70	2.03	1.78	0.87
8.	Equipment, Apparatus, Furniture and Stores	9.37	8.81	10.50	10.41
	(a) Capital Expenditure	3.02	2.78	4.23	5.06
	(b) Current Expenditure	6.35	6.03	6.27	5.35
9.	Unspecified	14.81	13.79	18.95	14.97
	(a) Capital Expenditure	4.91	0.56	6.46	2.90
	(b) Current Expenditure	9.90	13.23	12.49	12.07
10.	Total: (a) Percent	100.00	100.00	100.00	100.00
	(b) Amount	1.50	4.20	36.67	131.23
	(in crores of Rs.)				
11.	Capital Expenditure as percentage of total expenditure	25.07	9.83	20.14	22.41

TABLE 5

Changes in the Sources of Finance of the University of Delhi and all Universities, 1955-56 and 1964-65

S. No.	Source	Delhi University		All Universities	
		1955-56	1964-65	1955-56	1964-65
0.	1	2	3	4	5
1.	Central Government	68.63	64.26	14.67	22.23
	(a) Current Expenditure	40.09	55.62	8.36	13.18
	(b) Capital Expenditure	28.54	8.64	6.31	9.05
2.	State Governments	1.48	10.88	35.25	38.10
	(a) Current Expenditure	1.46	9.99	28.15	31.98
	(b) Capital Expenditure	0.02	0.89	7.10	6.12
3.	Fees				
	Current Expenditures	21.21	19.96	35.18	29.02
4.	Endowment				
	Current Expenditure	1.14	1.07	1.39	0.73
5.	Other Sources	7.54	3.83	13.51	9.92
	(a) Current Expenditure	5.27	2.94	7.03	6.09
	(b) Capital Expenditure	2.27	0.89	6.48	4.83
6.	Total Percent	100.00	100.00	100.00	100.00

from 2 to 1.7 per cent in the Delhi University as against 4.2 to 3.3 per cent for all universities. There is also a fall in the share of expenditure on games and sports in the University of Delhi and all universities taken together. The library expenditure has shown substantial improvement with respect to the Delhi University and it has risen from 1.8 to 5.8 per cent during the decade as against the increase from 1.7 to 3.8 per cent with respect to all universities. Expenditure on erection, installation and maintenance of buildings, equipment, apparatus, furniture and stores has gone down from 29 to 16 per cent in the University of Delhi while it has gone up from 22 to 24 per cent for all universities taken together.

Mobilization of Resources

The main resources for finance for the university education in India are the following:

1. Central Government;
2. State Governments;
3. Fees;
4. Endowments; and
5. Other sources.

In Table 5 (on page 6) changes in the contribution of different sources for the University of Delhi and all universities taken together has been shown.

Sources-wise distributions of expenditure have been calculated on the basis of tri-annum average figures centered around 1955-56 and 1964-65. It is observed from the table that contribution of the Central Government had decreased from 68.6 to 64.3 per cent with respect to the University of Delhi during the decade. On the other hand, the contribution of Central Government has gone up from 14.7 to 22.2 per cent for all the universities taken together. There is also a change in the pattern of the contribution made by the Central Government to the University of Delhi and all the universities taken together. The Central Government contribution to the University of Delhi with respect to capital expenditure has declined from 28.5 to 8.6 per cent but with respect to current expenditure it has gained a weight of 16 percentage points. With

respect to all universities the Central Government's contribution to current and capital expenditure has gone up during the decade. The State Government's share in all universities has gone up from 35.3 to 38.1 per cent and with respect to the Delhi University it has gone up from 1.5 to 10.9 per cent.

Fee income, which forms the internal source of the university finance, has declined from 21.2 to 20 per cent with respect to the Delhi University and from 35.2 to 20 per cent for all universities taken together.

Rising Unit Costs of Education

In order to estimate unit costs of education from the private, institutional and social points of view, detailed data about private, institutional and other costs are required. At present, sufficient information is not available about private and other social cost of university education. On the basis of the recurring expenditure alone average operating expenditure per student year for the University of Delhi and all universities taken together have been shown in Table 6 below.

It may be mentioned here that the average cost per student year for plan years shown in the table are based on tri-annum average figures of enrolment and expenditure. It is observed from the table that the cost per student year in the University of Delhi has gone up from Rs. 759 to Rs. 1,428 during 1950-51 to 1966-67. Similarly, cost per student year for all universities taken together has increased from Rs. 417 to Rs. 832 during the same period. The cost per student year are much higher in the Delhi University as compared to all universities taken together. Perhaps costs per student year in the Delhi University are one of the highest in the whole country because of differences in the pay scales of the university teachers, structure of enrolment, and overall allocations of expenditure between capital current costs. It is not possible for us to go into details of the difference in the costs here except to point out that the University of Delhi has to find out the ways and means

TABLE 6

Growth in Average Operation Cost Per Student year in the University of Delhi and all Universities, 1950-51 to 1966-67

S. No.	Year	Delhi University		All Universities	
		Amount (in Rs.)	Growth rate	Amount (in Rs.)	Growth rate
0	1	2	3	4	5
1.	1950-51	759.95		417.09	
2.	1952-53	890.06	+8.2	475.50	+6.8
3.	1955-56	950.39	+2.2	488.65	+0.9
4.	1958-59	1,116.01	+5.5	556.21	+4.4
5.	1961-62	1,401.81	+7.9	665.93	+6.0
6.	1964-65	1,311.95	-2.2	774.99	+5.2
7.	1966-67	1,427.63	+4.3	832.48	+3.7

to arrest the growth in the costs of inputs at different levels. This may be done by examining the workload of teachers, rationalisation of size of classes and institutions etc.

In table 6, average operating cost per student year has been arrived at by pooling together recurring expenditure of all the colleges and university departments, correspondence and non-collegiate courses, and programmes for private students run by the External Cell of the university and dividing it by the enrolment in the corresponding courses put together. In Table 7, (below) however, an attempt has been made to calculate average operating cost per student year at the undergraduate and postgraduate levels only with respect to the regular students enrolled with the colleges and with the university departments.

While working out cost per student year at the undergraduate level, recurring expenditure of all the colleges put together is assumed to have been incurred on the students enrolled in the undergraduate classes. Similarly, all the recurring expenditure of the departments and of the university has been assumed to have been incurred on the students enrolled in the postgraduate courses. It is clear from Table 7 that average cost per student year in 1968-69 was almost double of the expenditure at the undergraduate level. But in 1970-71, it is observed that the increase in average cost per

student year was faster at the undergraduate level as compared to the postgraduate level. The average cost per student year was Rs. 1,457 at the undergraduate level as against Rs 2,637 at the postgraduate level.

In Table 8 below, another attempt has been made to find out the differences in the cost per student year according to different faculties of the university

Recurring expenditure by faculties was not available. While working out cost per student year in Table 8, Faculty-wise Plan and non-Plan expenditure has been pooled together and divided by the enrolment in faculties. It is observed from the table that average cost in all the faculties put together at the postgraduate level is considerably pulled down by including the non-collegiate courses, where the average cost worked out to only Rs. 74 in 1968-69 and it further declined to Rs. 58 in 1972-73. As expected the postgraduate courses in Science Faculty were costliest among all the faculties presented in the Table. It is seen the cost per student in Science faculty was R. 2,844 as against Rs. 1,058 in 1972-73. Because of low enrolment, the courses in Music Faculty are also very costly. The average cost per student year here worked out as high as Rs. 2,092 in 1968-69. However, it has declined to Rs. 1,655 in 1972-73 but still continued to be highest, next to the post

TABLE 7
Average operating cost per student year at the Undergraduate and Postgraduate levels, 1968-69 and 1970-71

S. No.	Year	Enrolment		Recurring Exp. (in Lakhs of Rs)		Cost per student year	
		Under-graduate	Post-graduate	Under-graduate	Post-graduate	Under-graduate	Post-graduate
0	1	2	3	4	5	6	7
1.	1968-69	42.65	6.82	5.24	1.64	1229.89	2406.33
2.	1970-71	50.60	8.62	7.37	2.27	1457.58	2637.41

TABLE 8
Enrolment Expenditure and Cost Per Student Year, 1968-69 and 1972-73

S. No.	Faculty	Enrolment		Expenditure (in Lakhs of Rs)		Cost per Student year	
		1968-69	1972-73	1968-69	1972-73	1968-69	1972-73
0	1	2	3	4	5	6	7
1.	Art and Social Sciences	4,383	5,489	26.86	58.07	613	1,058
2.	Science*	2,512	2,149	54.64	61.11	2,175	2,844
3.	Law	981	3,050	4.94	12.35	503	405
4.	Mathematics	536	800	2.26	3.32	423	416
5.	Business Management	401	852	2.98	4.06	743	475
6.	Music*	101	160	2.11	2.64	2,092	1,655
7.	Non-collegiate	1,913	3,779	1.42	2.18	74	58
8.	Total	10,927	16,279	95.21	143.73	879	883

*Also includes Hons. students whose classes are held in the Department.

graduate courses in Science Faculty. Mathematics and Business Management showed a decline in average cost per student year between 1968-69 and 1972-73. This area of investigation will be revealing if a detailed study of the faculty-wise estimates and factors responsible for their variation is carried out by the university.

Socio-economic Status of Students

Prof. A. M. Khusro carried out *A Survey of Living and Working Conditions of Students of the University of Delhi* in 1957-58. His investigation revealed that 77.8 per cent of students covered by the survey were born in urban areas. Further, residences of fathers of 91.6 per cent were located in urban areas. 78 per cent of the students belonged to families whose per capita income was less than Rs. 150 per month and 41 per cent of the students came from the families whose per capita income was less than Rs. 50 per month. On the social status of students, Professor Khusro noted as: 'It turned out that they come in fact from poor or lower middle class families or at best from what has for sometimes been called the middle class (p. 38). 70 per cent of the students depended on the financial support of their families, 4 per cent on scholarships and 23 per cent on self-earnings. While analysing the expenditure pattern of the students, the study revealed that educational expenses amounted to 42.8 per cent of the total expenditure in the case of students coming from families where per capita income was less than Rs. 50 per month and 26.2 per cent where the per capita family income was Rs. 175 and above. Transport and food accounted for 9.6 and 22.3 per cent of their total expenditure respectively. The picture might have changed altogether by now. In the absence of any fresh study, it is difficult to find out inter-temporal changes in the socio-economic profile of the student beneficiaries of higher education of the university.

The Directorate General of Employment and Training of the Ministry of Labour and Employment carried out employment survey of alumni of the Delhi University in 1958. It covered graduate cohorts of 1950 and 1954. It revealed that 7.2 per cent of 1954 graduates as against 3.3 per cent of 1950 graduates continued to be unemployed even in 1958. The share of those not seeking work was 5 per cent in 1950 cohorts and it rose to 9.6 per cent of 1954 cohorts. Percentage of self-employed was 10.2 per cent with respect to 1954 cohorts as against 13.3 per cent of 1950 cohorts. Comparative analysis of income distribution of 1950 and 1954 cohorts revealed that the 12.2 per cent of the former group of the graduates earned monthly income exceeding Rs. 750 per month as against 6.6 per cent of the latter group of graduates.

Note on Appendix

Time series data on enrolment, expenditure by objects income by sources are given. The data has been taken from the records of the Planning Unit of the University of Delhi and the Statistics Division of Ministry of Education and the University Grants Commission.

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[davp 74/142]

Library Orientation Course

KURIAN G. VARGHESE

THERE is no library service worth the name in our educational classes. What public libraries we have are also in a lamentable state. Hence freshmen to our colleges have little opportunity to familiarise with modern library practice viz. the classified arrangement of books, the use of card catalogue and the technique of finding out information from various reference sources. So they are bewildered when they enter the college libraries. It is all the more so where 'open access' is allowed which implies the ability in students to find out required documents by themselves. As there is no systematic attempt to give necessary instruction it is only by the arduous method of trial and error that they pick their way through much waste of precious time and energy. Still they remain largely unaware of the reference works even in their special fields of study and ignorant of how to make profitable use of any reference work. And then time runs out before the library resources are effectively exploited.

In recognition of this grave situation the University Education Commission under the chairmanship of Dr S. Radhakrishnan declared that "it should be remembered that the undergraduates have to be educated in the use of library as in so many other fields". (i) The seminar held under the auspices of the UGC made it more explicit by recommending that "Each library should give orientation courses, by which is meant the imparting of instruction with demonstration to readers, especially to freshmen in the use of the library." (ii) As in the case of any other skill it is only through instruction and practice one would learn how to find information quickly and easily. "A knowledge of the use of the library is essential not only to get the most out of the whole college experience but to save time," said Ella V. Aldrich. (iii) Even in advanced countries where adequate library facilities exist at school level it is considered necessary to impart instruction in the use of the library to freshmen in colleges.

The world of knowledge being so tremendously expanding no one these days can be expected to have all the facts on one's finger tips. But an educated person should be informed of where and how to find out what he wants to know. The library being the only store house of information, a thorough acquaintance with its resources and the technique it employs becomes an important part of education. "We cannot have either adequate study of a subject or effective research in it if our libraries are not well stocked and if our libraries are not properly used" says Dr. Samuel Mathai. (iv)

In order to promote creative use of leisure and constructive thinking the students should be introduced to "the exciting possibilities of discovery and to standards of work which go beyond examination results. Preparing students for intellectual adventure may be possible only when they are introduced to ongoing learning, when they are helped to become confident in their judgement". J. Edward Dirk. (v) Needless to say that a thorough knowledge of library methods is essential to achieve this.

"...The true aim of education and the true purpose of teaching technique should be to equip the students to meet the new situations bound to arise from time to time in his later life. For this he should be trained, even while still in college, to help him to find out by himself any information or knowledge needed to satisfy his curiosity and to serve his interest."—Library Committee of the U.G.C. (vi)

In the light of the above a library orientation course should be introduced to all new entrants to colleges. It may be implemented in two stages viz. Stage I at I.P.D.C and Stage II at I.D.C. levels. A suggested syllabus is given on the next page.

(i) Radhakrishnan Commission Report 1948-49, P 111 clause 53.

(ii) U.G.C.—University and college libraries P 204.

(iii) Ella V. Aldrich : Using Books and Libraries P 1

(iv) U.G.C.—University and College Libraries P 155.

(v) J. Edward Dirk : Rethink our role, report of a joint consultancy by CISR & S, Bangalore and Madras Christian College P 86.

(vi) UGC—University and College libraries P 42

LIBRARY ORIENTATION COURSE

Syllabus in 2 parts of 30 hrs. each

PART I—30 Hrs.

General Introduction—Purpose of orientation course : full exploitation of the resources of the local college library; equip oneself to make use of libraries everywhere—to venture into wider world; formulation of library habit which would be helpful in later life for continuing education.			
The Library—Definition, history, functions. Types of libraries ; Public and special, meaning, roles, Academic libraries.	2	5	12
Library movement-world, India, Kerala.	1		
Important libraries—World, India, Kerala.	1		
Organisation of Library.	1		
Sections and their working :			
Circulation section—charging, discharging, important methods.	1	2	2
Reference section—Types of books, care, periodical section, stock room, Reading room, technical section.	1		
The College Library—Its place in higher education.	1		
Role, Departmental libraries.	1		
Library rules and their importance.	1	5	9
College Reference works—General introduction.	2		
The Book—History, making, care.	3		
Parts of book—Title page, copy right, preface or forward, contents, illustrations introduction, text, notes, Glossary, appendix, bibliographies; index-General and other cumulative index.	2		
Classification of books—			
Need, various systems.	1	4	9
D.D.C, Colon.	2		
Call No— Class and book No; shelf arrangement.	1		
Library Catalogue—Functions, physical forms, advantages	1		
Card catalogue; Basic guide, different cards Different methods of entry—	1	4	5
A L A, C C	1		
Alphabetical arrangement, guide cards, writing call slips.	1		
Open access—Benefit, responsibility of readers	1		
Revision and test	3		

Preliminary—summing up and confirmation of previous portion.			2
Reference books; meaning, types, care.	1		
Use—importance of date of publication, scope, arrangement, biblios, authority, cross reference.	1		
Important types <i>Encyclopedias</i> — for basic information, general, special, Important works by subjects; works by languages— English, Hindi, Malayalam.	2		
<i>Dictionaries</i> —for information on words.			12
important ones in English, Hindi, Malayalam.	2		
<i>Year books, Biographic Dictionaries, Who's who Gazetteers, Atlases, Indexes</i>	2		
Important reference works held in subjects including those in literature, quotation etc.	2		
Making bibliography—for books, articles from encyclopedias and other reference works, articles from periodicals, magazines and newspaper.	1		
— Do — Practical	1		2
Finding out information—Practical			2
Research paper — An exposition aimed to present the results of careful and thorough investigation of some chosen subject.			
Objective — efficient use of library, familiarising with Scholarly documentation, increase ability to take useful notes, teach to organise and combine material from various sources.			
Types — Report, thesis (Report presents facts of a subject while thesis presents facts to draw conclusion); May be short essay or a dissertation.	2		
Preparation of research paper — Choosing the subject, limiting the subject, working bibliography, introductory reading, note taking, stating the thesis, classifying information, preliminary outline, composing (presentation in own words), documenting the evidence (foot notes), conventions in making foot notes, bibliography.	5		
Exercise	2		
Revision and test			3
			30

British Universities

Autonomy Vs Accountability

Is there a conflict—University autonomy versus public accountability and control—if so, is it reconciled?

THE basic paradox of the autonomy of British universities can be quickly stated. They are all chartered bodies and their charters, on the face of it, give them important degrees of independence and autonomy. Yet they are utterly dependent on the state for their funds—on central government, local government and the research councils. Here then is the potential conflict: university autonomy versus public accountability and control. Is there such a conflict and if so how is it reconciled in practice?

We should begin by recognizing the sensitivity, indeed perhaps the sense of insecurity, that universities sometimes feel today on this issue. Universities the world over feel themselves under strain—on the defensive—and British universities are no exception. They have, of course, their much publicized, indeed their over publicized, student troubles. No one in the university world can tell where and when student trouble is likely to break out next. Nor how long any outbreak will last, or how it will finally be settled. All one does know is that when trouble strikes the institution concerned can be gravely affected. A vast amount of time and attention is swallowed up. Intending applicants may think again before including that university in their preference list. But student troubles apart, and it is all too easy to exaggerate their scale, university staff feel on the defensive about accusations that they pursue (at great public expense) the teaching and research which interests them or furthers their careers rather than trying to meet "the needs of society". They feel trapped between the expectations of their students for new and better courses, for more student accommodation, for more student welfare services and the squeeze of inflation which is only partially compensated. They feel the planning uncertainties of cuts on university building and the shifts in student applications both in total and for particular subjects. It is against this background that one has to put the response of British

universities to the call for their greater public accountability.

I am pleased to say that their response was positive. For in my five years at the University Grants Committee I found almost unanimous acceptance in university circles that increased public accountability was necessary and inevitable. It was accepted that university level teaching and research were today so expensive (especially in science, technology and medicine) that only the state could provide resources on the necessary scale. The hundreds of thousands of students and staff who have to be supported, the vast amounts of capital locked up in university land, building, and equipment, make it inevitable and proper that Parliament should have the right to ask universities to explain what they have been doing. To show that they have pursued their objectives without waste of public funds and have dispensed public money in accordance with Parliamentary rules. In this situation of fast growth of public funds for university teaching and research and growing involvement in public accountability what has happened to university autonomy?

Superficially a case could be made for the view that an important diminution in the autonomy of British universities has come about in the last decade—in particular with the tighter control of university building. The Government is necessarily concerned with the size of the annual entry of students in relation to the numbers of qualified school-leavers, with the division of total student numbers into broad categories—science and arts, undergraduate, and post graduate and with a few special groups destined for public service such as the number of medical students and teacher-training places. Provision of money for new buildings is the main instrument by which, in Britain, the intentions of Government at the centre are translated into practice at individual universities. The system is worked broadly on the principle of measuring in considerable detail the physical capacity of each university building for teaching and research, or for feeding,

The author, formerly chairman of the UGC, is the UK Government's chief economic adviser.

housing, administering, as the case may be. Recurrent money is then provided to utilize the buildings to their capacity and universities to their best to attract and admit the agreed number of qualified students.

It should be realised that this system of capacity planning is both uncommon internationally and is of fairly recent development in Britain. It started, in its present form, with the planning of our new universities (we have created a dozen new campuses in recent years). The planning committees had to be given indications of the money likely to be available for each thousand students for new buildings for all purposes—academic, social, welfare, student accommodation. The system of “norms” for space and for standards evolved for each of the many different kinds of accommodation needed by a university. At the same time the submission of application for new buildings for both old and new campuses was improved and elaborated. Today it is no exaggeration to say that our system of university building control and capacity measurement is the most detailed of any in the Western world. Every foreign visitor interested in university planning seizes this aspect to question and probe and the memoranda of instructions for capacity measurement and for submissions for new buildings are very much in demand overseas.

This then is the first important sense in which British universities are not autonomous. They cannot grow as fast as or in the directions they may wish. A university can ask not to grow or to grow more slowly—though the internal pressure for growth, for new faculties and new buildings, plus the sense of a need to take a fair share of a national requirement, means that a request to grow very slowly seldom happens. Where it does the reluctance to grow of one institution can be balanced by the strong desire for growth of another. At the end of the day growth overall has to be of a size and form which fits into a broad national plan and to building standards which are in line with what the nation feels at any time it can afford. No difficulty has yet been felt in getting university growth plans adjusted to fit into this pattern.

The second important area of constraint is on the length of their courses. There is always understandable academic and professional pressure to increase the length of course as one way of raising standards. Knowledge and techniques continually expand and advance. There is a desire to add new aspects to a course or to provide broader, more multi-disciplinary courses while not sacrificing too much of study in depth. It is always easier to get agreement to add than to get agreement to delete and it is always emphasized that British degree courses are by world standards extremely short. Nevertheless the potential cost to the taxpayer of a steady move from three-year degrees to four years needs no emphasis. Under their charters British universities are degree-giving bodies and in principle they could decide always to require not less than four years' study for a degree. But in practice they respect the convention that such a move would have first to be acceptable to the Government and there is little sign at the moment that the state is ready to

afford such a shift.

A third area of constraint, and one which is similar to the limitation on the freedom of universities to lengthen their courses, is the recent limitation on the proportion of postgraduate work. This is a new development and it is too soon to comment on the possible effects. The pressures to expand postgraduate work are sometimes similar to the pressures to increase the length of courses. Advances in knowledge which cannot be encompassed in the undergraduate course tend inevitably to spill over into more graduate courses. But there are many other pressures, some stemming from inside the university as students want to continue after their first degree and staff want both to teach them at advanced levels and to involve them in research work. Many pressures stem from outside the universities as professional bodies and government departments ask for the creation of new graduate courses including post-experience courses oriented to their needs. At present the limitation on postgraduate work is in quite general terms—universities are asked not to expand graduate work at the expense of their undergraduate target numbers. If this new constraint should prove painful it may well be necessary to subdivide postgraduate work into its very different elements and apply different criteria and number to each. Otherwise the results of the limitation may be unnecessarily bad both from the universities and the government viewpoint.

The fourth area of constraint on the autonomy of universities stems only partly from the side of Government. It is the constraint on their freedom to vary the salary and conditions of service of their academic staff. In recent years these have increasingly become the subject of national negotiations between the vice-chancellors; the trade unions and government. The salary scales are national scales and the agreements tend to become more detailed and to apply to ever wider groups of academic and administrative staff. Again universities are in principle autonomous and any one of them could in theory disregard these national agreements in some respect or other. In practice I believe that they have found the growth of organized collective bargaining on a national scale in universities a natural and inevitable development. In one sense it is a loss of autonomy. In another sense it is part of the protection of the living standard of their staff without which their academic standards would soon be bound to suffer. In asking how these limitations on their autonomy have affected British universities it should be said that there have been some moves in the other direction. Universities have been given more flexibility in the use of current money for capital purposes and in the promotion of a higher proportion of junior staff to senior status. Above all the block grant principle, an unusual feature in British public finance, has been fully preserved.

In most parts of the public sector, institutions are much less free than universities in the use of their monies. A university has assets, investments, bank accounts, balances. It can carry its monies forward from year to year and from quin-

quennium to quinquennium. It gets a block grant which can be used for all recurrent purposes and it spends that grant as it thinks fit in the pursuance of its academic objectives in teaching and research and in attempting to meet its obligations on student numbers.

This is not to say that what a university does with its money is in any sense secret. Far from it. Each university publishes its accounts annually. The comptroller and auditor-general's staff have access to all books and files. And in few countries are the accounts and statistics of university finances, staff and student numbers and degrees obtained published in the detailed and comparable form that is the practice in Britain. It really is possible to see, year after year, how much each university spends in each department on staff and supplies or how much on libraries, indeed how much on entertainment. My only regret is that it seems to take so long for the accounts of the past university year to be collated and for the printed volume finally to appear.

The block grant, I am sure, serves both the public interest and the universities' interests. It serves the public interest because it concentrates detailed decision taking where it should be concentrated—at the local level. That is to say it is a major spur to economy and efficiency for a pound saved is a pound to spend on some even more pressing academic or welfare need. It serves the universities' interest for instead of asking for more under this head or that head the block grant means that priorities have to come into each decision to spend on current purposes and those priorities can be (subject to the constraints I have already described) the universities' priorities.

The UGC has had to become an organisation for university planning as well as an organization for putting to the Government the universities' case for support. Planning is bound to mean constraints of one kind or another and questions of university autonomy were necessarily part and parcel of my daily life during my five years with the committee. Constraints there were and I have tried to indicate where the constraints have come to be strengthened in recent years. But in my view the important aspects of university autonomy are not concerned with the size and standards of buildings nor even with the size and growth rate of the university. The real autonomy is the choice of students, the choice of staff, the content and standards of degrees, the right to research and to publish. In these areas there is no questioning of university autonomy except perhaps that unhappy decision of the National Union of Students restricting freedom of speech on our campuses.

However, freedom of admission brings us to the issue of whether universities should be national and international or regional and local. The arguments in favour of regionalism are partly economic—it would be cheaper if more students lived at home and attended the local university and partly political—it would be better if universities were more highly integrated into the local educational framework, were more responsive to local

needs and interests, were more influenced by local governments. As for the economic argument, that living at home is cheaper, that must be so. But the educational arguments for getting away from home are strong and many who go to a "local university" do not live with their parents. Also the sheer variety of British universities means that no two courses are quite alike; no two campuses, no two life styles. No two students are alike either and the desirability of letting students try to find out which place, which course is likely to suit them best and then try to get there is obvious.

It is sometimes argued that autonomy is important but that the price is high for it means that universities do not need to respond to the needs of the world outside. "They may grow but they don't change." After five years of travel round the universities of the British Isles and five years doing nothing except study the process of change in our universities I can challenge that assertion with complete confidence. So they do change and change quite fast and they do respond to the needs of the world outside if only for one very strong reason. Each of them desperately wants to attract both the best possible students and a growing amount of extra money for research. So they are much more consumer-oriented than most outsiders believe. Indeed there is often a danger of a bandwagon effect as too many universities want to move in the same currently fashionable direction at once. There is a danger that too many new departments will start offering similar courses, that too many universities will try to move into similar taught masters degrees. The bandwagon effect is then allied to the ratchet effect. Once a department is created it is heaven's own job to get it uncreated for the staff have tenure. Similarly once the staff have worked up and taught masters degree there is a temptation to keep it going hoping that next year's application list will be better. Universities are less flexible, less consumer-oriented, when it comes to major changes of direction such as away from physics and towards social science.

It would be hard to find any institutions that have changed as much as universities in the past twenty years. Perhaps the most obvious is the degree of democracy and the methods of discipline. Gone are the days when the vice-chancellor was a god and his word was law. "Always in full possession of his faculties" as was said of one VC. Gone are the days when students discipline was summery and swift and unchallenged. Gone too are the days of Victorian laboratories and lecture rooms and primitive equipment and cold libraries. Today we see a remarkable expansion of welfare services, health services, careers advice services. There is a growing admission that we are not all born lecturers, that we need training, need to be taught the possibilities of educational technology in constructing our courses. It's not all perfect—far from it—but is very different from a few years ago.

*This article is an edited version of his Joan Woodward Memorial Lecture given at Imperial College, London, on May 30, 1974 which has relevance to Indian conditions as well.

Round Up

AICTE wants setting up of Vocational Education Council

THE All India Council for Technical Education has recommended the setting up of a National Council for Vocational Education with corresponding Boards or Councils in the States. This will review and coordinate the policies and programmes of vocational and technical education and provide effective linkages between them. The programme of vocationalisation of education should provide for inter-changeability among technical, vocational and general streams. Students enrolled in any of these streams should be able to join the degree and diploma courses at the appropriate stages and credit should be given to them for the courses they have already undergone. The Council wanted that the existing facilities in all educational institutions should be fully utilised to organise programmes of non-formal and continuing education. These should include part-time and correspondence courses to equip a large number of people with appropriate skill and competences.

The Council has also suggested the setting up of a Central Advisory Committee to assist the Union Government in the development of Regional Engineering Colleges in future. The financial and administrative pattern for these colleges should be

decided by the Centre in consultation with State Governments.

The Council, which met recently under the chairmanship of the Union Minister of Education, Social Welfare and Culture, Prof. S. Nurul Hasan, felt that technical education should be regarded as core sector for the industrial development of the country. The consolidation and development of technical education is crucial for the next five years. Adequate inputs should, therefore, be ensured during the Fifth Plan period. Meanwhile, studies of the estimated manpower requirements for the principal sectors of economy should be carried out discipline-wise, State-wise and region-wise. The policy of admission to technical educations during the Fifth Plan period can be determined on the basis of these studies.

The Council wanted appropriate linkages to be established among educational and research institutions and industry. Technical institutions should accept the responsibility within their resources and expertise for organising cooperative programmes like apprenticeship training and sandwich courses. They should also assign specific projects on live problems of industry to students in technical

institutions should be encouraged to undertake consultancy practice. The Council recommended a programme of industrial residencies for teachers in engineering colleges and polytechnics to provide them with adequate industrial experience.

Crop Technology Workshop

A four-day State Level Crop Production Technology workshop was inaugurated by Dr. C. Thakur, JNKVV Vice-Chancellor at the Vishwa Vidyalaya in April. Dr. P. S. Parsai, Additional Director of Agriculture, M.P., was the Chief Guest at the function. Senior officers of the State Department of Agriculture working at State; Division and District levels participated in the workshop.

The Vice-Chancellor expressed his concern over the present day shortage of agricultural inputs like fertilizers, diesel for running irrigational pumps, etc. Since these had a direct bearing on the crops production, he exhorted the participants to evolve such package of agricultural practices for the year 1974 which might be fruitful in the context of the current energy and fertilizer crises.

He stressed that not only the main points but all the useful details of crop-production should be worked out and they should reach the farmers with clear and specific recommendations.

Dr. Parsai, in his address, said that the main objective of the JNKVV and the State Agricultural Department has been to increase the agricultural production. He said that the production targets in wheat and pulses were already crossed. In paddy, targets remained to be achieved.

He stressed the urgent need for increasing the production in crops like cotton, sugarcane, and oilseeds, and urged their special attention in package of practices.

World Translations Over 40,000 A Year

WHILE the number of translations made across the world climbs 42,970 in 1971, compared with 38,172 in 1970 the kind of work considered worth translating continues to reflect the kind of world we live in. According to Unesco's annual stock-taking of world translations Lenin is more translated than the Bible (381 translations against 215) but the British children's writer Enid Blyton (165 translations) beats Karl Marx (148); Agatha Christie (144) Jules Verne (143) and Georges Simenon (132) are ahead of Friedrich Engels (128). Dostoyevski with 110 translations, Mark Twain with 90, Pearl Buck with 89 and another children's writer,

Sweden's Astrid Lindgren (85), make up the 'Top Twelve' of most translated authors.

Of the world total of translations, the USSR, with 4,730, took the lead from the Federal Republic of Germany and German Democratic Republic with 4,649 between them. Spain with an increased total of 3,148 lies third in the table followed by Denmark (3,038), USA (2,284), Italy (2,282), Japan (2,225), France (1,991), the Netherlands (1,968) and Yugoslavia (1,460). Brazil increased the number of translations from 431 to 1,036, so did Belgium (1,058 against 765) Hungary (1,053 against 842) and Turkey (799 against 616).

UNITAR Conference Opens

A SCIENTIFIC conference on problems of the future opened in Moscow on 10 June.

The conference is examining problems of economic, social, scientific and technical development as well as international cooperation and the role of the United Nations in settling these problems.

The conference is being conducted by the United Nations Institute for Training and Research (UNITAR) jointly with the Institute of World Economy and International Relations of the Soviet Union and the State Committee for Science and Technology of the Soviet Union.

More than 60 prominent scientists and public figures from various countries are participating in the conference.

New Light on Brain Drain

WHEN a doctor leaves India to settle in the United States it amounts to a loss of Rs. 330,000

for India and a gain of Rs. 5,175,000 to the U.S.

Likewise every scientist leaving India makes the country poorer by Rs. 172,500 while adding Rs. 18,75,000 to the wealth of America.

In 1970 a total of 3,141 Indian doctors and scientists emigrated to the U.S. thus contributing a staggering Rs. 6,563 million to that country in a single year by way of brain drain.

These and other 'monetary effects' on brain drain have come out of a latest study by the U.N. Conference on Trade and Development (UNCTAD) of what it calls on the reverse transfer of technology.

The overall picture that has emerged from the study "is one of a massive net income transfer from the developing countries to the U.S. in the form of brain drain."

According to the study the "reverse transfer of technology" has reached massive proportions, and the biggest contributions are made by countries that are among the poorest in the developing world itself.

PERSONAL

1. Dr. Arun Kumar De has taken over as Director of IIT, Bombay.
2. Shri Y.P. Shukla has been appointed Vice-Chancellor of Saurashtra University w.e.f. 11-7-74.
3. Shri A.K. Gupta has been appointed Registrar of Jadavpur University.

Colour Film On PAU

MR. S. SUKHDEV, the veteran documentary producer of the country has been sponsored by the Punjab Agricultural University for making colour film on its activities. The 2500 ft. long film depicts the activities of almost all the departments which have a direct bearing on the State's agriculture. The commentary is in English and its highlight is the Kisan Mela where the keen and curious farmers rush from place to place to collect new seeds and new information. The background music is based on folk song tunes which very well fits in the atmosphere of the film.

Invitation From Abroad

VICE-Chancellor of Jadavpur University, Prof. A.N. Bose, will attend the International Congress on Food Sciences and Technology at Madrid from Sept. 22 to 27, 1974. After that he will attend the International Conference on Basic and Applied Research Needs for Optimising Utilisation of Rice by Products at Valencia, Spain, as one of 50 selected participants.

National Status for Cal. Varsity

THE University of Calcutta is emphasising the need to impress for granting national status to Calcutta University by the

Central Government. Dr. S.N. Sen, Vice-Chancellor of the university, is expected to meet the Union Minister for Education, Prof. Nurul Hasan and some members of Parliament to acquaint them with the different aspects of the problem. The university is anxious that the recommendations of Ghani Committee appointed by the UGC are implemented at an early date. Prof. Sen hoped that if sufficient money was sanctioned for development, the university could become one of the best educational institutions in the country.

Number of Seats Cut By PAU

THE Academic Council of the Punjab Agricultural University has decided to cut down the number of seats for admission to undergraduate programmes of the College of Agriculture and the College of Agricultural Engineering from the ensuing academic year. This decision has been necessitated in view of the stringent financial position and job requirements. The number of seats have been reduced from 225 to 140 on the College of Agriculture side and 80 to 60 in the College of Agricultural Engineering.

New Electro-ejaculator Developed by PAU

THE scientists at Punjab Agricultural University have developed an electro-ejaculator to collect semen samples even from young growing untrained male-bulls. With this, semen of those young bulls and rams, who are expected to have high genetic potential will be collected.

The new technique—electro-ejaculation, is a very useful method of semen collection from males that refuse to serve the artificial vagina or when their injuries and infirmities make it impossible to collect the semen. This will prevent the potential of high-priced animals going waste.

The ejaculator consist of a

single rectal probe of an ebonite rod, 17 inches long and one and a half inch in diameter with an active length of nine inches and diameter of one inch. It suits the size of the rectum. It has a copper wire ring which works as an electrode and is attached to a power amplifier. When fed from a pulse generator, it produces electrical signals for stimulation leading to ejaculation of semen which is artificially collected.

PAU's Research Projects

Seven research projects at PAU are being financed under the PL-480 scheme at a total cost of Rs. 19,73,050. The schemes relate to genetic evaluation of grain and fodder quality of bajra; development and evaluation of triticales; genetic evaluation of pulses; economic potentials of grain production in a growing economy; fermentative conversion of plant materials into feed and seed protein; and studies on the leaching and absorption of pesticides in soils and affect of their residue on plants.

Dr. Walter M. Carleton, Acting Director USDA and Dr. Horace J. Davis, Agricultural Attache, presented cheques for the first instalment of Rs. 6,46,000 to the chief investigators of these

seven research projects on May 24.

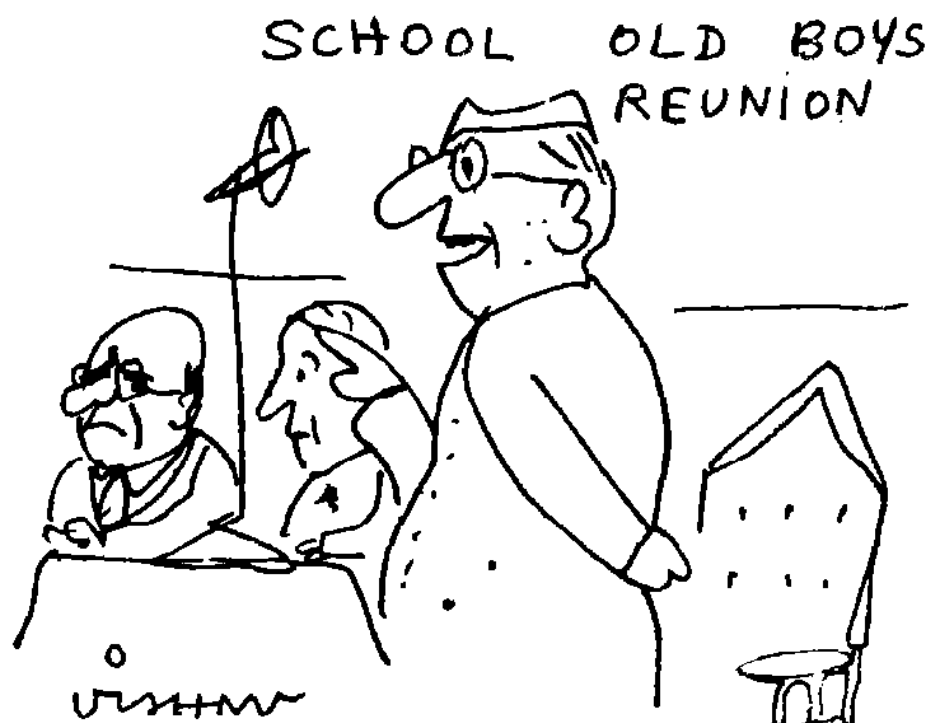
New PU Vice-Chancellor

DR. R.C. PAUL, who took over as Vice-Chancellor of Panjab University from Mr. Suraj Bhan, on July 1, was felicitated at a reception held by the Faculty and administrative staff of the University on July 15.

Dr. Paul who did his Ph.D. in 1954 and Sc.D. in 1968 from Cambridge (UK) holds fellowship and membership of various scientific and academic bodies. He has visited USA, USSR, Hungary, Ceylon and Japan under different academic programmes.

Speaking on the occasion, Dr. Paul said that his new assignment was quite a challenging task. Education, to him, was a cooperative endeavour. He looked on it as just another opportunity to serve students, teachers and the cause of education. He said that the Faculty, the administrative and the affiliated colleges had to function in a spirit of harmony and with a sense of devotion to build a better tomorrow for the coming generations.

Dr. Paul called upon the Faculty to look after the general



"You owe us a deep debt of gratitude because you wouldn't have these modern buildings if we hadn't burnt the old School down in youth....."

welfare of the students apart from their academic pursuits. They should solve students' problems and encourage them as senior people with a view to contributing to their balanced growth as the future citizens of the country.

The Vice-Chancellor, while referring to the recent dis-affiliation of 102 colleges of Haryana

the current financial year to provide self-employment to educated unemployed on a large-scale.

Under the employment promotion programme, 1,500 to 2,000 industrial units are planned to be set up. Assistance of leading banks in the districts is being enlisted for providing loans to the unemployed for setting up the units. These prospective entrepreneurs will be given consultancy assistance in the formulation of projects they may like to undertake. The units are expected to have a total investment of Rs. 15 to Rs. 20 crores.

Training schemes for technically qualified people and schemes for development of ancillary and functional industrial estates and areas, in addition to schemes for development of urban markets and marketing complexes, are being drawn up to give a fillip to the programme.

award of grants-in-aid for research work in major branches of science and technology, including Medicine, Engineering and Electronics, to be conducted at universities, colleges and such other recognized research institutions in the State as can provide post-graduate research facilities.

Seminar on Tuberculosis

UNDER the auspices of Sri Venkateswara University, a Seminar on recent trends in the diagnosis and treatment of pulmonary tuberculosis was held recently at the S.V. Medical College Auditorium.

Dr. Shantilal C. Sheth, President, Medical Council of India, who inaugurated the Seminar referred to the advances in the treatment of tuberculosis and said that if we were not able to eradicate that disease with the present available drugs it would be a matter of shame. Referring to the establishment of Medical Universities in the country, Dr. Sheth said that the Council is yet to give its opinion.

Dr. D. Jaganatha Reddy, Vice-Chancellor of the University who presided over the seminar said that tuberculosis as public health morbidity problem ceased to exist in economically over developed countries largely due to the mass screening measures, use of chemotherapeutic drugs, BCG and better nutrition of children. He suggested that survey-cum-screening and therapy team may be set up in each medical college. He said multipurpose health assistants or educators be trained for eradication of tuberculosis, malaria, smallpox, filaria, leprosy and other communicable and infectious diseases. He added, that instead of wasting man power and money on individual eradication programmes let the medical colleges assume the role of medical centres.

Sports Hostels

TRIALS for the selection of candidates for the two sports hostels in U.P. will be held shortly by the U.P. Sports Directorate. Trials for wrestlers will take place in the Central Sports Stadium, Lucknow, on July 29 and 30 and for athletes and hockey players in the sports stadium, Meerut, on August 2 and 3.

Set up by the Sports Directorate, the Lucknow hostel will provide training in wrestling and the Meerut hostel in athletics and hockey. The trainees will also be provided with board and lodging.

Competitors should be over 16 years on August 1, 1974, but relaxation of two years can be granted in the case of really talented ones.

U.P. Grants For Research

THE U.P. State Council of Scientific and Industrial Research has invited applications for the

Self-Employment Scheme

AN allocation of about Rs. 3.40 crores has been made by the Uttar Pradesh Government for

from this University. observed that education needed to be reorganized at all levels. He hoped that the cooperative efforts of teaching as well as administrative staff will help him to make this university as an outstanding institution of higher learning. He also paid tributes to the Vice-Chancellors who preceded him and said that the period that had just finished was a glorious period of this University in many respects.

It may be added that Dr. Pual was Professor & Head of Chemistry Department of the Panjab University before he took over as Vice-Chancellor.

Dr. R. C. Paul



Unfair Means Cases

THE number of cases of use of unfair means by students at various examinations held by Delhi University during the academic session 1973-74 was 1650. The students accused of unfair means have been served with show-cause notices and are being interviewed by a committee of senior teachers set up by the Executive Council of the University.

The analysis of unfair means used showed that student carried unauthorised slips of paper with answers written in very small hand-writing hidden in their socks, sleeves, pants and even their pens. In some cases the students even used their examination tickets to smuggle written answers to important questions.

The committee will give its findings to the Executive Council which will eventually decide the punishment to be awarded to the students found guilty of using unfair means.

Semester System In Agricultural Courses

THE Gujarat Agricultural University has introduced the semester system for all its graduate and postgraduate courses in the current session. Now the BSc students will have to finish 8 semesters each of six months duration and the MSc students are required to spend four semesters and doctoral candidates six semesters. Examinations are to be conducted at the end of each semester with greater emphasis on internal evaluation. This means the students will have to continuously keep up a good performance. The university had discontinued from this session the Indian Dairy Diploma Course offered along with BSc (Dairy Technology).

Women Studies Course

The Australian National University is working towards the establishment of a women's studies course.

The course will be unusual in Australia, and only the third to deal with women's studies. Unlike the two existing courses, it will be multidisciplinary, and is *not planned as part of an already existing department.*

Women planning the course include staff and students at the Australian National University, in Australia's National capital, Canberra.

Mrs O'Brien one of the course organisers said subjects for the course were planned over a wide range and would include a discussion on why the course existed.

Topics would include a history of the women's movement and the current interest in feminism, as well as a study of the rationale of oppression.

More specialised subjects could include the law as it affects women, women in the political economy and women and political systems.

Science of the Utkal University has been selected as a National Associate of the University Grants Commission for a period of five years. Dr. Das is the first teacher to receive this National honour from Utkal University.

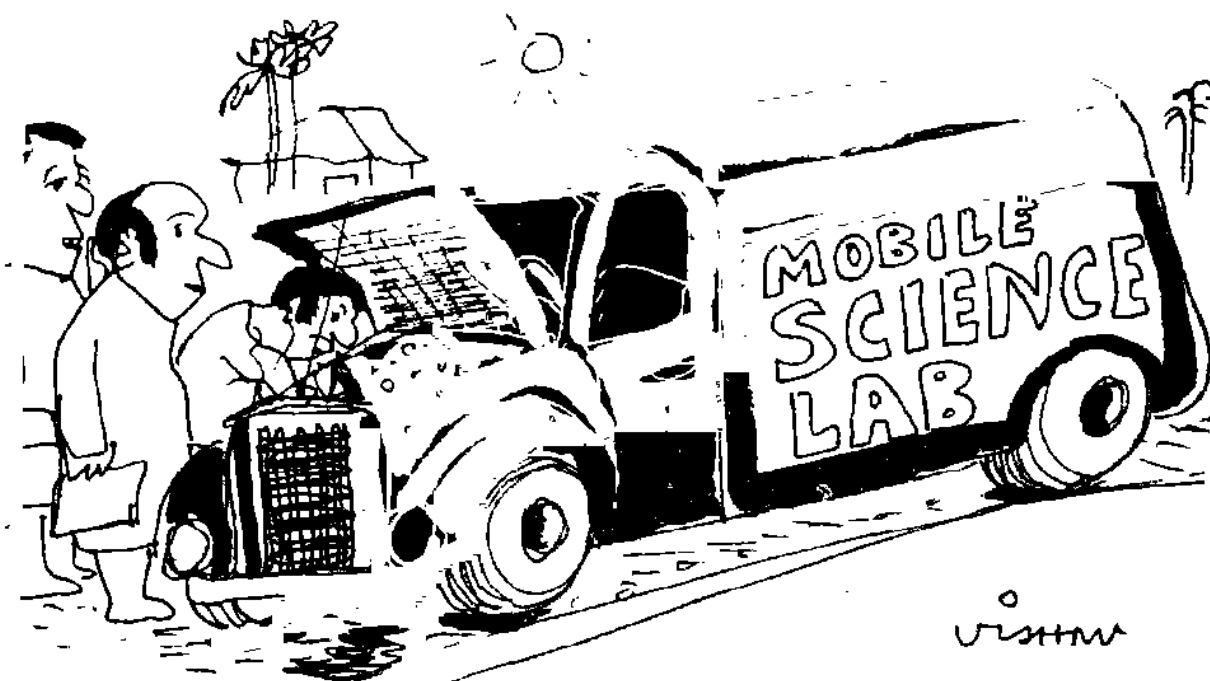
The University Grants Commission shall bear all the expenses for his visit to Universities, research institutes and libraries in connection with his work.

UGC Review Committee Set Up

THE Government of India have set up a Committee to review the functioning of the University Grants Commission (U.G.C.) with particular reference to coordination and determination of standards of higher education. The Committee will recommend measures, which will be conducive to a more effective discharge of its responsibilities by the U.G.C. The Committee is headed by Dr. V.S. Jha, an eminent educationist, who has been Vice-Chancellor of Banaras Hindu University and a member of the Education Commission. The other members of the Committee are Dr. R.C. Mehrotra, Professor of Chemistry, Rajasthan University, and Dr. Bhabatosh Datta, formerly Education Secretary, Government of West Bengal.

UGC Award For Dr. Das

Dr. B.C. Das of the Postgraduate Department of Political



"We should have given first priority to training motor mechanics before embarking on this Scheme....."

Long Wait For Employment

POSTGRADUATE scientists have to wait for about a year on an average to get employment and 30 per cent of the job seekers are first divisioners.

This is revealed in a study conducted by the Council of Scientific and Industrial Research (CSIR), in collaboration with the Institute of Applied Manpower Research.

According to the live registers of the employment exchanges in Delhi as in December 1972, one-third of the 2,108 Scientists had been on the registers for six

months, another one-third for six to 12 months and the remaining over one year.

About 30 per cent of the registered persons were first divisioners, 60 per cent second divisioners, and 10 per cent third divisioners.

The average period of stay on the live registers after obtaining Master's degree was 24.3 months. The study observed that the average gap of 12.6 months between obtaining the degree and the date of registration might be because some of them did not register immediately after passing, and others might have secured temporary jobs in between.

The average salary expected by the post-graduates for employment in Delhi was Rs 259 a month. Only four to five per cent desired salary above Rs 500

a month.

Nearly 60 per cent of them were reluctant to accept jobs outside Delhi while others did not mind going out but expected higher salary of Rs 354 a month on an average.

The average salary expected by first divisioners was Rs 272 a month as compared to Rs 254 and Rs 242 a month demanded by second and third divisioners respectively.

The subject-wise distribution of the registered persons showed that about 29 per cent possessed qualifications in chemistry, 27.5 per cent in physics, 23.5 per cent in mathematics and statistics and 18 per cent in bio-sciences.

Thirtyfive per cent had obtained their master's degree in 1972, 27 per cent in 1971 and 38 per cent in 1970 or earlier.

Students Welfare Funds

THE Bangalore University has launched a scheme to raise funds for student welfare activities. The project would not only enable the university to establish a meaningful relationship between different sections of the society and the student community but would provide assistance to the students where they need it most. The Vice-Chancellor has constituted a representative programme coordination committee to implement the scheme.

It is planned to start a "Book Bank" to help the needy students of colleges affiliated to the university. Poor students will also be financially assisted in purchasing books and will get help for paying their tuition fees. If enough funds are available, even recreation facilities in campuses may be provided.

It is expected that the Karnataka Film Chamber of Commerce will be contributing handsomely to this fund. Banks will also be requested to sanction loans to deserving students. It is expected that a collection of Rs. 15 lakhs will be made soon from these sources.

NSO SPORTS TALENT SCHOLARSHIPS 1974-75

Last date of receiving applications, on the prescribed proforma, for fresh NSO scholarships in the office of the Inter-University Sports Board, for the academic session has been fixed as 15th September, 1974. Printed application forms have been circulated to the member universities. Those desiring to apply may, therefore, contact the Sports Officers/Registrars of their respective universities for application forms and other details.

The scholarships are available only for the bonafide students of the member universities subject to other terms and conditions laid down in this behalf. No application shall be entertained unless sent on the prescribed proforma and through the university concerned.

Seven Scientists Get ICAR Awards

SEVEN eminent agricultural scientists have been selected for the Rafi Ahmed Kidwai memorial Award for the biennium 1968-69 and 1970-71, by the Indian Council of Agricultural Research.

They are: Dr. S. Y. Padmanabhan, Director, Central Rice Research Institute, Cuttack (Plant Pathology), Dr. Abrar M. Khan of Aligarh Muslim University, Aligarh (Nematology), Dr. B. P. Ghildyal of G. B. Pant University of Agriculture and Technology, Pantnagar (Agricultural Physics), Dr. S. M. Sircar, Director, Bose Institute, Calcutta (Plant Physiology), Dr. S. Z. Qasim, Director, National Institute of Oceanography, Panaji, Goa. (Fisheries), Dr. J. V.

Bhat of Indian Institute of Sciences, Bangalore (Microbiology) and late Dr. S. C. Sen, former Sugarcane Chemist, Rajendra Agricultural University, Bihar (Sugar Technology).

The Rafi Ahmed Kidwai memorial award was instituted by the Council in 1956, with a view to providing incentive for Research workers in India and to recognise outstanding research work done in the fields of agricultural, animal husbandary and allied sciences.

The value of the award is Rs. 10,000 in cash or kind or both. So far 17 scientists have been honoured with this coveted award for their outstanding researches since 1957.

Donations For Gujarat Varsity Courses

The Centre for Continuing Education, Gujarat University, under the Management and Professional Training Programme has started the following employment oriented courses:

- (1) Stenography and Secretarial Practice ;
- (2) Salesmanship and Marketing of Cotton Textile;
- (3) Bank Recruitment Test Training.

The programme in Stenography and Secretarial Practice, is supported and provided by Shri Vadilal Lallubhai with donation of Rs. 8,000/-.

For the second programme, in Salesmanship and Marketing of Cotton Textile, Shri Indravadan Pranalal has donated Rs. 8,000/-.

For the third programme of Bank Recruitment Test Training, Shri Parshwanath Trust has donated Rs. 5,000/-.

Further the University has received a donation of 3,00,000/- from Advocate Shri Kanishkabhai Kazi in the memory of his father Shri H.L. Kazi for starting an Institute of English and Foreign Languages in the University from November, 1974. This Institute will not only provide training or teaching in English and research in the methodology of teaching English, but also conduct classes in German, Spanish, Japanese and Russian languages. This Institute will also provide Interpreter services.

The University has further received a donation of Rs. 4,00,000/- from Dr. Biharilal Kanaiyalal for a School of Business Management, to be named after him. The School will offer a two-year programme in the Master of Business Administration after graduation. The programme will be started from November, 1974.

Honour For Indian Scholar

THE University of Queensland, Australia has awarded its first Degree of Doctor of Letters to a distinguished Indian Scholar; Professor Damodar P. Singhal. The rare honour is only the sixth in Australian academic history.

Professor Singhal, formerly of Delhi, studied at the University of Punjab for his Master's Degree and later at London University for his Ph.D.

He was a Lecturer in History at the University of Malaya in Singapore before joining the staff of the University of Queensland in Brisbane in 1961 as a Senior Lecturer. He is now

the Professor of Asian History.

Professor Singhal has produced nearly 40 papers and five books, including the prestigious two-volume work INDIA AND WORLD CIVILISATION, which has been published in the United States of America, India and the United Kingdom. He also has lectured in the U.S.A., Europe and many parts of Asia.

The Doctor of Letters Degree was awarded by the University for his "substantial contribution to world scholarship", particularly in the field of Indian History, culture and foreign affairs.

The University of Queensland (established in 1911), which has an enrolment of 19,000, is the major centre of Asian Studies in Australia with emphasis on Japan, China, India and Indonesia.

Science and Technology Plan 1974-79 (Draft)

Draft Science and Technology Plan prepared by the National Committee on Science and Technology in two volumes is now on sale. Vol. I of the Plan (Price Rs. 10/-) spells out the guiding philosophy underlying the S & T Plan and highlights the areas where technological efforts need to be directed. Vol. II (Price Rs. 50/-) gives detailed projects and programmes under the various sectors.

Copies may be obtained from the Under Secretary, N.C.S.T., (Deptt. of Science & Technology), Technology Bhavan, New Mehrauli Road, New Delhi-110029 against a Draft drawn in his favour.

davp 647(3)/74

Naval Science Laboratory

Dr. B. D. Nag Chaudhuri, the then Scientific Adviser to Defence Ministry, Govt. of India laid the foundation for the Naval Science and Technical Laboratory at Visakhapatnam. It is proposed to develop modern naval weaponry and conduct research on different aspects of navigation. Dr. Chaudhuri said that the major gap in research and development in defence was on the naval side and this laboratory would fill this gap. The proposed building for the laboratory would involve an expenditure of Rs. 3 crores. The laboratory would also be testing the weapon systems and would be responsible for designing and developing the vehicles which will carry the weapons to their targets.



Aerial view of the crater created by the May 18 underground nuclear test at Pokaran.

Are the Librarians Academicians?

Library service as the basis of all academic pursuits has become a wide accepted fact of the modern educational patterns. Even the Laboratory activities need support of library services like abstracting and indexing to avoid repetition and to locate points of departure from new Scientific advances. It may be called as an essential ecological condition for the multiplication of the cells of human knowledge. Almost invariably a reputed educational institution is characterized by a well supported library, while, to reverse the coin, unlively libraries typify mediocre educational institutions, and an apathy of well managed libraries would cripple the academic life, leaving it as an inconceivable concept.

With these concepts in mind eminent academicians like Henry Wriston, Ex. President of Brown University, Harvie Branscomb, the chancellor of Vanderbilt University, have strongly pleaded to equate the status of librarians to those of his faculty colleagues. Harvie Branscomb in his book 'Teaching with Books' has advocated quite explicitly and in a comprehensive manner that college libraries are primarily a teaching instrument, and the professional workers play a vital role in the teaching processes. President Daniel Gail Gilman, of Johns Hopkins University, one of the most influential American Educationist has said, 'The Librarians' office should rank with that of a professor. The profession of librarian should be distinctly recognised. Men and Women should be encouraged to enter it, should be trained to discharge its duties and should be regarded, promoted and honoured in proportion to the services they render. (Lyle, Cuy R: The Administration of the College

library. Ed 2. N.Y. Wilson, 1948, p. 277). Dr. C.D. Deshmukh, the renowned educationist of India in 1959 with a view to build up the educational career of India, could also organise the Indian librarians to join this march-past of academicians, by aptly remarking, 'a librarian is teacher of teachers'.

Thus it can be emphatically stated that the old classification of academicians categorizing only the persons who stood in front of a class room full of students has vanished and at present it embraces the categories like librarians and research workers who practically have nothing to do with class teaching. In other words, the diversity of the present day activities of modern Universities would not allow ridiculously to narrow definition of academic staff limited to the class room teachers only, but would widen its scope to include everyone contributing directly and substantially to educational and research activities. The advisory group of the Carnegie Corporation in 1928, recognising the services of Librarians included in its college library standards published in 1932, its pertinent recommendations stating therein, 'In view of the importance of the services rendered by the library staff, its members should receive adequate recognition in the academic community with respect to salary, scales, standards for advancement, security of tenure, etc. The college librarian should have administrative power covering the entire library organisation, and should be responsible directly to the administrative head of the college.

Another factor establishing the academic status is the duties of librarians, which is more akin to those of teachers and research

workers than to those of non-teaching staff. They impart instructions to students in the use of the library, and aids to research. They understand not only the contents of the materials they handle, but also the prevailing views concerning methodology and organisation of knowledge and the epistemology of accumulation of knowledge. And it is why the Southern Association of Colleges and Secondary Schools, in a report published in 1947, recommended for the integration of the library with the teaching processes.

In order to achieve this intellectual level a librarian must study not only the special methods of librarianship but also the factual content of the areas in which they plan to work. His educational background is much more wider than that of a classroom teacher, who is called upon to be an expert in one sphere only. The technical processing of library materials involve a special aptitude and calibre, craving for a comprehensive familiarity with books, journals, pamphlets, and unpublished data covering the universe of knowledge.

The resources of an University library are so extensive and complex, as to make their use difficult for an uninitiated student. Thus there exist orientation programmes for the new entrants to encourage a full comprehensive use of the services of libraries. This work is formalised through classroom teaching.

The librarians are contributing to the objectives of the very existence of colleges and Universities by making available resources for study and research, and hence a classroom teacher, a research scholar, a librarian and other members of the academic staff together form a team for the academic pursuit. Each has to play a vital role in this pursuit and the omission of anyone would certainly alter the very character of the educational activity.

BADRI PRASAD GOSWAMI
Central Library,
Banaras Hindu University,
Varanasi-5.

SHIVAJI UNIVERSITY, KOLHAPUR

Advertisement

APPLICATIONS are invited for One post of Professor and One post of Lecturer (Statistics) in Mathematics in the scale of Rs. 1100-50-1300-60-1600 and Rs. 400-40-800-50-950 respectively.

Applicants for Professor's post should possess First or Second Class Master's Degree and Doctorate Degree in the subject of a Statutory Indian or Foreign University of repute and experience of teaching Post-Graduate classes for about ten years and guiding successfully some Ph.D. students. Published research work of acknowledged merit will receive due consideration.

All reasonable facilities for research will be available.

Applicants for the post of Lecturer should possess First or Second Class Master's Degree OR a Doctorate degree with at least Second Class Bachelor's Degree OR any other equivalent degree or degrees of an Indian or Foreign University and Five Years' experience of teaching graduate classes at the special or principal level (wherever applicable).

Seven copies of applications on plain paper giving particulars as per advertisement should reach the Registrar, Shivaji University, Vidyanagar, Kolhapur-416004, on or before 13th August, 1974.

No. SU/EST/PG/171 Usha Ithape
Date: 31-7-1974 REGISTRAR

SAMBALPUR UNIVERSITY JYOTI VIHAR, BURLA

Advertisement

No. 22115/TDS. Dated 29-7-74

APPLICATIONS in the prescribed form with attested copies of mark-sheets and certificates of all examinations passed are invited for the following teaching posts in the University College of Engineering, Burla.

I. Description of Posts Vacant

1. Professor of Physics	One
2. Professor of Mathematics	One
3. Professor of Electronics and Telecommunication Engineering	One
4. Reader in Electronics and Telecommunication Engineering	One
5. Lecturer in Electronics and Telecommunication Engineering	One

II. ESSENTIAL QUALIFICATIONS

1. Professor of Physics/Mathematics
 - i. First Class Master's Degree and/or Doctorate degree with considerable research experience.

- ii. Total experience of ten years out of which 5 years shall be in teaching and/or research.

- iii. (a) Physics—Specialisation in Solid State Physics or Electronics.

- (b) Mathematics—Specialisation in Elasticity or Fluid Mechanics and Dynamics/Control systems/Differential Equations/Optimisation processes/Operations research.

If a suitable candidate for Professorship will not be available, a Reader may be appointed.

2. Professor of Electronics and Telecommunication Engineering

- i. A first class Bachelor's degree or Postgraduate degree in Electronics and Telecommunication Engineering.

- ii. Total experience of ten years out of which five years should be in teaching and/or research.

- iii. Specialisation in one or more of the following fields:—

Electrical and Electronics measurements and Instrumentation/Communication theory/Microwave Engineering/Radio T.V. and Radar Engineering/Solid State Electronics.

3. Reader in Electronics and Telecommunication Engineering

- i. A first class Bachelor's Degree/Master's degree in Electronics and Telecommunication Engineering or a first class Bachelor's degree in Electrical Engineering and Master's Degree in Electrical/Electronics and Telecommunication Engineering with specialisation in any one or more of the fields of specialisation as mentioned for the post of Professor above.

- ii. Seven years experience in teaching/Industry/Research for Bachelor's degree holders, which is relaxable by two years for candidates having Master's degree in Engineering.

4. Lecturer in Electronics and Telecommunication Engineering

- i. A first class Bachelor's degree or Master's degree in Electronics and Telecommunication Engineering/a first class Bachelor's degree in Electrical Engineering with a Master's degree in Electronics or Telecommunication Engineering.

III. DESIRABLE QUALIFICATION

1. Professor of Physics/Mathematics

- i. Experience in guiding research.
- ii. Doctorate Degree.
- iii. Teaching experience in an institution of University standard.

2. Professor/Reader in Electronics and Telecommunication Engineering

- i. Experience in guiding research.
- ii. Corporate membership of recognised professional institutions.
- iii. Doctorate degree.
- iv. Teaching Experience in an institution of University standard.

3. Lecturer in Electronics and Telecommunication Engineering

- i. Some research experience and capacity to conduct independent research.
- ii. Teaching experience in a University standard institution.
- iii. Corporate membership of recognised professional institutions.
- iv. Doctorate degree.

IV. AGE OF RETIREMENT

Sixty years for all the above posts.

V. SCALES OF PAY

Professors—Rs. 1100-50-1300-60-1600.
Readers—Rs. 700-50-1250.
Lecturers—Rs. 400-40-800-50-950.

All the posts carry usual dearness allowance as would be sanctioned by the University from time to time.

Seven copies of the application form will be supplied from the University Office to each candidate in person on cash payment of Rs. 2/- (Rupees two) only. Candidates intending to receive forms by post are required to send (a) a crossed Indian Postal Order of Rs. 2/- payable to the Finance Officer, Sambalpur University, Jyotivihar P.O. Burla 768017 (b) a self-addressed envelope (23 cm x 10 cm) with postage stamps worth Rs. 2/- affixed to it with the words 'APPLICATION FORM FOR TEACHING POSTS IN THE SAMBALPUR UNIVERSITY' superscribed on it. Money orders or cheques will not be entertained.

The last date of receipt of application in the office of the University is the 1st September, 1974.

The selected candidates will be required to join within one month from the date of the issue of the appointment order. The candidates will be required to appear for an interview at their own expense before Selection Committees. Issue of this advertisement does not make it binding on the part of the University to make the appointments.

Suitable persons may be appointed on contract basis on a higher initial pay if it is deemed desirable in the interest of the University.

All communications should be addressed to the Registrar by designation only and not by name.

(B. Misra)
REGISTRAR

SOUTH GUJARAT UNIVERSITY

P.B. No. 49, Surat

Applications are invited for the posts of (1) University Librarian (2) Accountant (3) Lecturer in Applied Statistics (Econometrics) in the Pay Scale of (1) Rs. 800-50-1250 (2) Rs. 640-35-990-EB-45-1215 and (3) Rs. 400-40-800-50-950 respectively with usual allowances.

The minimum qualifications for the posts are as under:

1. **University Librarian:** Master's Degree with a Degree or Diploma in Library Science and at least ten years' experience of Library work in a University or a College in a position of responsibility, including experience of teaching in field of Library Science. Preference will be given to those who have (i) Master's Degree in Library Science (ii) Proficiency in the work of Books selection and Bibliography and knowledge of different scheme of classification (iii) Working knowledge of one or more foreign languages.

2. **Accountant:** (i) A Chartered Accountant with at least three years' experience OR

(ii) A Post Graduate Degree in Commerce with at least ten years' Accounting experience.

OR

(iii) A graduate with fifteen years' experience in accounting out of which five must be in a position of responsibility. A degree in Commerce will be preferred.

3. **Lecturer in Applied Statistics (Econometrics):**

(a) Second Class Master's Degree in Economics with specialisation in Econometrics

AND

Five years' teaching experience in the Degree classes or two years' teaching experience in the Post Graduate degree classes or some published research work or some published work of merit.

OR

(b) Ph.D. Degree in the subject.

The application must be submitted in the prescribed form which can be had from the University Office on payment of Rs. 1/- in Cash or by Postal Order drawn in the name of Registrar, South Gujarat University. Candidates for the post of Lecturer in Applied Statistics will have to submit eight copies of application. Those who desire to obtain the application form by post must send self addressed envelope of 23 Cm.x13 Cm. size duly stamped for 0.40 Paise.

Persons who are employed in Government, Semi-Government or Public Corporation must send their applications through their present employers.

The last date for receipt of the application is 31-8-1974.

G.A. Desai
REGISTRAR

Surat,

Date: 20-7-1974

BERHAMPUR UNIVERSITY

BHANJA BIHAR, BERHAMPUR-7,
(GANJAM)

No. 5897/Admn./BU/74

Dated the 25th July, 1974.

ADVERTISEMENT

Applications are invited for the following Teaching posts for the post graduate Departments of this University.

Sl. No.	Subject	Vacant Posts	No. of Vacancies
1.	Linguistics	Professor	One
		Lecturer	One
2.	English	Professor	One
		Lecturer	one
3.	Zoology	Reader	One

Scale of Pay

(i) Professor:—1100-50-1300-60-1600/-

(ii) Reader:—Rs. 700-50-1250/-

(iii) Lecturer:—Rs. 400-40-800-50-950/-

Plus usual allowances as admissible by the University from time to time.

Professor

Qualification and Experience.

(i) shall be a scholar of eminence.

(ii) shall possess a first or second class Master's degree (with at least 48 % marks) in the subject.

(iii) shall have a Doctorate Degree or published work of equivalent standard.

(iv) shall be engaged in active research and shall have experience in guiding research.

(v) shall have teaching experience in a college or a University teaching Department for at least ten years in the subject of which at least three years shall be in the post graduate classes.

(vi) **For Professor of Linguistics:—**

The candidate should have passed M.A. in any Indian language/comparative philology/Linguistics.

Reader in Zoology

The Candidate shall have.

(i) A first or second class Master's Degree (with at least 48 % marks) in the subject.

(ii) A Doctorate Degree or published work of equivalent standard.

(iii) Teaching experience in a College or in University Department for at least eight years in the subject of which

two years preferably be in post-graduate classes.

(iv) Capacity to guide research shall be regarded as an additional qualification.

Qualification for the Post of Lecturer

(i) The candidate shall have a first or second class Master's degree (with at least 48 % marks) in the subject.

(ii) **For Lecturer in Linguistics:—**

The candidate having M.A. in Indian language/comparative Philology may also apply.

Note :—This supercedes the previous advertisement for the post of Professor and Lecturer in English. Applications already received for the post of Professor and Lecturer in English in response to the earlier advertisement No. 4701 dated 10-6-74 will be taken into consideration and those applicants need not apply again.

Seven copies of the prescribed application forms will be supplied to the candidates from the office of the undersigned on payment of Rs. 1.50 paise in person or by Bank Draft drawn on the State Bank of India, or by Money order in favour of the Registrar, Berhampur University, Bhanja Bihar, Berhampur-7 along with a self addressed envelope measuring 22x10 Cms. affixed with postage stamps worth of Rs. 0.85 paise.

The applications duly filled in along with attested true copies of certificates, testimonials and publications etc., should reach the undersigned on or before 31st August, 1974. Applications received after the due date will not be entertained.

Candidates who are in service should apply through proper channel.

Persons in Government service selected for appointment shall be allowed leave salary and pension contribution for one year only if they wish to retain their lien under Government.

The prescribed period of experience for the posts will be calculated up to the last date fixed for the receipt of the application.

Sd/- R.C. Rajguru
REGISTRAR

PHYSICAL SCIENCES

Mathematics

1. Birajdar, Neelkanth Shankarrao. Some problems in boundary layer theory with or without magnetic field. Marathwada University.

2. Oma Rani. Contributions to the theory of mathematical programming. University of Delhi.

3. Ram Autar. A study in information theory through generalized functional equations. University of Delhi.

4. Sitapathi, A. Fluids with microstructure. Andhra University.

Physics

1. Gupta, Subhash Chandra. Laser induced nonlinear investigations in some materials. University of Delhi.

2. Pandya, Grishbabu Revashanker. Study of crystal surfaces: Bi-Sb alloys. M.S. University of Baroda.

3. Souryanarayan, M. Studies in upper atmosphere. Gujarat University.

Chemistry

1. Desai, M.N. Published work. D.Sc. Gujarat University.

2. Makwana, S.C. Studies in corrosion of aluminium 3-s. Gujarat University.

3. Mane, Appasaheb Shivappa. Heterocyclic compounds of nitrogen and nitrogen boron. Shivaji University.

4. Mishra, Narendra. Lattice dynamics of some metals. Bhagalpur University.

5. Sekhon, Bhupinder Singh. Physico-chemical studies on complex formation. Panjab University.

BIOLOGICAL SCIENCES

Biochemistry

1. Grewal, Shavinder Singh. Studies on the polar lipid metabolism of sunflower, *Helianthus annuus*, seed during development. Punjab Agricultural University.

Botany

1. Bahadurpal Singh. Studies of the vascular anatomy of the flower of certain species of the compositae. Jiwaji University.

2. Gohil, R.N. Cytogenetic studies of some Indian alliums. University of Kashmir.

Zoology

1. Deshmukh, Kalyanrao Khanderao. Studies on the development of the heart and circulatory system in calotes versicolor. Marathwada University.

2. Gopinath Menon, K. Certain metabolic aspects of feather development moult and regeneration in pigeon, *Columba livia*: A histochemical study. M.S. University of Baroda.

3. Hegde, S.N. Studies on the domestic fowl with reference to the role of the caeca gamma-ray irradiation of developing chicks and chick nutrition. Karnatak University.

Medical Sciences

1. Trivedi, H.D. Pharmacological analysis of effects of photosensitization in vivo and in vitro. Gujarat University.

Agriculture

1. Balasubrahmanyam, M. Studies on the effects of herbicides on onion, *Allium cepa* L. Tamil Nadu Agricultural University.

2. Bhandari, Narendra Raj. Influence of phosphorus-zinc and potassium-calcium application on okra. Punjab Agricultural University.

3. Janarthanan, R. Studies on the host parasite relationships on the reniform nematode, *Rotylenchulus reniformis* Linford and Oliveira, 1940 on some pulse crops. Tamil Nadu Agricultural University.

4. Khara, Jagir Singh. Differential contribution of some correlates of trained young farmers influencing their pot... effectiveness. Punjab Agricultural University.

5. Kumaran, K. Investigations on intra-racial... indica, hybrid sterility in rice, *Oryza sativa* L. Tamil Nadu

Agricultural University.

6. Mariappan, V. Studies on virus diseases of weeds in relation to crop plants. Tamil Nadu Agricultural University.

Veterinary Science

1. Hothi, Didar Singh. Studies on the pathology of arteriosclerosis like condition in sheep. Punjab Agricultural University.

SOCIAL SCIENCES

Psychology

1. Kaul, Bimla. Construction and standardization of a test to identify creative children in the age range of 14 to 16 years. M.S. University of Baroda.

Political Science

1. Chandradeoprasad. The political ideas of Dr. Ram Manohar Lohia. Magadh University.

2. Sharda Prasad Singh. Aspects of India's constitution in the making: Union-State relations, 1946-1950. Bhagalpur University.

Education

1. Patel, Yashomati Fulabhai. An inquiry into the relationship between the pupils attitudes and the teacher influence in the classroom. M.S. University of Baroda.

Commerce

1. Bendre, Vinod Pandharinath. A study of tourism in India with special reference to Marathwada. Marathwada University.

HUMANITIES

Literature

English

1. Rajyalakshmi, D.V. The poetry of Sarojini Naidu: A presentation of the major themes. Andhra University.

Sanskrit

Bhatt, Jayantilal Amrutlal. Study of R.V. Mandal VII with particular reference to Vasisthas. Saurashtra University.

2. Hemlata. Rigved ke agni-sukton ke upmaon ka adhyayan. Bhagalpur University.

Hindi

1. Avasthy, Rekha. Pragativad aur uske samanantar sahityik privrittiyan. Bhagalpur University.

2. Indira Kumari Singh. Jayasi ke vishisht sahbda vali ka vishleshnatmak adhyayan. Bhagalpur University.

3. Sonavane, Chandrabhanu Sitaram. Arya samaj ka Hindi gadya sahitya. Shivaji University.

Marathi

1. Jagdale, Kunta N. Bharud literature in Marathi. S.N.D.T. Women's University.

Gujarati

1. Pandya, U.C. Principles of poetic criticism, eastern and western and their application to Gujarati literature. Gujarat University.

Telugu

1. Arunakumari, B. Historical works in Telugu literature upto 1700 A.D. Andhra University.

2. Kasivisweswarasastry, Kottapalli. A study of the poetical work of Avyalaraju Ramabhadra kavi of 16th century. Andhra University.

Kannada

1. Sharanamma, R. Puligere: Its historical, literary and cultural significance. Karnatak University.

History

1. Birendra Bahadur Singh. History of Sarnath from the earliest times to 1200 A.D. Magadh University.

2. Annoon, Abdullah Ibrahim H. Some aspects of water resource and development in the Damodar Valley Region. University of Delhi.

CURRENT DOCUMENTATION IN EDUCATION

A list of select articles culled from Periodicals received in AIU Library during
June-July 1974

EDUCATIONAL PHILOSOPHY

- Adiseshiah, Malcolm S.** "Relevance of adult education to our educational crisis." *Indian Journal of Adult Education* 35 (1); Jan 74: 3-8.
- Bailey, Stephen K.** "Education and the state". *Educational Record* 55 (1); winter 74: 5-12.
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trial review

CHRONICLE OF HIGHER EDUCATION & RESEARCH ★ September 1974 Re. 1.25

**Universities And
The Public**



**Visitor's Enquiry
Committee**



**Changing Character
of Indian Varsities**



At the 11th Annual Convocation of Punjabi University,
Patiala

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UNIVERSITY NEWS

Vol. XII
No. 9



SEPTEMBER
1974

A Monthly Chronicle of Higher Education

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Opinions expressed in the articles and reviews are individual and do not necessarily reflect the policies of the Association.

Editor : ANJNI KUMAR

Sports Medicine Conference

The 4th Annual Conference of Indian Association of Sports Medicine was organised by The Bihar Association of Sports Medicine at Patna. Bihar Association of Sports Medicine, with its headquarters at Patna, was formed only a year ago. The response shown by young Doctors and Physical Educationists in Bihar was excellent.

The conference was inaugurated by Dr. Ramraj Singh, Education Minister, Bihar, who is also the Chairman of Bihar State Sports Council on July 13, 1974. Dr. A.K.N. Sinha, President-elect of Commonwealth Medical Association and Past President of Indian Medical Association was the chief-guest. Dr. P.C. Bhatla, Secretary of Indian Medical Association (Headquarters) was specially invited to be the guest speaker at the inaugural function. Dr. H. N. Singh, President B.A.S.M. and Chairman, Organising Committee welcomed the delegates and guest. Sri R.L. Anand, Patron, I.A.S.M. and Director N.I.S. Patiala was Present at the conference.

Dr. Ramraj Singh, in his inaugural address stressed the importance of developing and promoting Sports Medicine in Bihar. His speech was very encouraging for the members of the State Association who have taken up the cause of Sports Medicine in Bihar in the right earnest. He said he would give all possible help to set up a Sports Medicine cell in Patna.

Dr. A. K. N. Sinha, an eminent cardiologist said that the knowledge of Sports Medicine was being helpful in rehabilitation of cardiac patients in foreign countries. He asked for developing this new speciality in India and desired that research be carried out in different climatic conditions in our country. He requested the Government for giving all possible help for development of Sports Medicine in India.

Dr. P. C. Bhatla, Chief Guest Speaker, spoke about the importance of Sports Medicine in India and said that this branch was well developed in the U.S.A., U.S.S.R., U.K., Germany, Greece, Japan and some other countries and sportsmen were greatly benefitting from it. He wished that help be given by Government for developing Sports Medicine in India.

Sri R. L. Anand said that Sports Medicine plays a vital role in the career of athletes. He stressed the importance of research work in our country where factors were different from that of foreign countries.

Among the prominent sportsmen present were four former table tennis champions—Sri Prem Kumar, who is also A.I.R.'s Test Cricket Commentator, Apresh Ghosh, Banarsi Prasad and Dr. (Smt.) Ila Tripathi; Dr. Ehsan, former State Athlete and Dr. Ajay Bhagat, Bihar's former Ranji Trophy player.

On the second day, some scientific papers were read in two sessions. Dr. R. Dutta, Director, Health Services, Tripura, presided over the first session while Dr. Aloke Ghosh, President I.A.S. M., presided over the next session.

UNIVERSITIES AND THE PUBLIC

M. S. RAMAMURTHY

THE burgeoning enrolments is bound to have its impact on administration in Indian Universities. To cope with the pressure of numbers there has been a quantitative increase in the educational personnel without any thought being bestowed on changing the inherited structures. Very little attempt has been made to move from the stage of administration to that of management. Reliance is still placed on outmoded systems of control and a veil of secrecy still hangs around many of the discussions taking place in the university.

One characteristic of educational management is the involvement in one way or another of a variety of institutions, groups (including academics, students and parents), and individuals. To knit the diverse interests of these different elements and to impart any meaningful cohesion effective two-way communication is important. Barring the agricultural universities (which have departments of extension performing public relations functions) very few universities have made attempts to establish formal channels of communication between the focal points in the university where discussions take place and the colleges, the academics, the students, the public and the Government and *vice versa*. The result is that mangled versions and half truths gain currency to the detriment of the image of the university.

All that the public gets to know from the daily press about a university comes under shrieking headlines the burden of whose stories usually is: student unrest, examination muddle, financial bungling, academic's frustrations, etc. Indeed such reports have become so frequent that the faith of the public in the universities has been badly shaken.

In any democratic set up public support is one of the important factors which determines the kind of prestige and standing that an institution enjoys. No

university can function in isolation. And universities can win public support only if they consciously and continuously strive to engineer support through 'information, persuasion and adjustment'. All this is largely a matter of communication.

Effective communication is both an art and a science. In the last two or three decades a body of knowledge has been accumulated drawing largely from other disciplines, notably from the behavioural sciences. Besides, the potentialities and limitations of the press, the radio and the television as media have to be understood before they are put to use. The individual in charge of giving information and performing public relations functions in a university has to have a thorough grasp besides, & the communication process and the complexities of educational administration. Against the background of the foregoing it becomes quite clear that Indian universities have to take conscious steps to organise separate departments the legitimate functions of which will embrace information dissemination, public relations and act as a channel of communication. Only if these departments function efficiently can universities get even that praise which is due to them and counter act the impact of the half truths and other forms of ill-informed criticism which to a great extent is in evidence.

Aims

Having analysed the need for organising these information and public relations functions the aims of such a formal set up become clear. For the sake of specificity, however, we may spell them out in the following terms:

- To keep the university community—academics administrators and students—fully informed of decisions taken, developments made and planning undertaken;

The author is Evaluation Officer in the AIU.

—To give professional advice to the vice-chancellors and the other executives in the university on the choice of the media for giving information both under a normal situation and in a crisis situation;

—To prepare the drafts of necessary hand-outs and other material in this behalf;

—To take all necessary steps, after due authorisation, to project the image of the university with regard to its objectives, its programmes, its policies, its activities and, more especially, its needs;

—To function as a channel through which information from outside can flow into the university.

Organisational Structure

In the rather rigid and formal way in which universities in the country are organised it becomes important to say something about the status and authority that such a department dealing exclusively with information and public relations activities of a university should have. The normally stipulated officers of a university are the vice-chancellor, the registrar, the deputy registrars and the assistant registrars. If the head of the unit dealing with public relations and information activities has to be taken seriously by the university community and the community outside, it is necessary to ensure that the unit as well as its head occupies an important position in the hierarchy of the university. Since most of the decisions relating to policies, programmes etc. are taken at the level of the vice-chancellor (through executive council, academic boards, planning boards, committees or the like), the unit, it is suggested, should function under the direct authority of the vice-chancellor. This unit however should be available for consultation to the university community as well as the community outside the university. Indeed, depending on the nature and needs of a particular university, the head of such a unit, apart from the vice-chancellor, should be the only one who would be empowered to speak authoritatively on the activities and plans of the university. In order that the unit may not overreach itself, it is necessary to lay down in some detail the procedures that should govern the flow of information to the university and from the university. Given the will, it should not be difficult to evolve working arrangements for such a kind of flow of information from the academic community to the envisaged unit, from the envisaged unit to the public and vice versa.

This unit in a university can be entrusted with several activities. The dates of admission to different courses in the university, the method of submitting applications, the fees to be paid etc. are only the more common examples of the kind of information that this unit can give out. What is more important is the role it can play in educating the various public bodies and the community at large

about the objectives, the programmes, the plans and other activities of the university. In a democracy, it is only through education and persuasion that support can be had and without such support no institution can function as an energetic and a viable organisation.

There are other occasions at which this unit can play an active part. Convocations of universities have become rather dull and quite often places of "noisy" functions. While some of the reasons for disturbances on such occasions are more economic and sociological, a good deal needs to be done to enliven such occasions. This perhaps is one occasion when the local community could effectively participate. All kinds of cultural activities like exhibitions, fetes etc seem possible on the occasion. Given the necessary authority and one with vision as head of the unit there is no reason why this unit cannot effectively function in projecting a better image of the institution and in winning the active support of the entire community.

Indeed, public relations is not publicity seeking nor dissemination of information, *Simpliciter*. Public relations is that activity "which is deliberately pursued for the sake of obtaining support for an organisation in order that it may survive and accomplish its purposes. In the case of education, these objectives are those that have been accepted and are expressed through constitutional provisions, laws, bye-laws and rulings of the Boards and it is in the obtaining of support for these objectives only that public relations has a place in educational administration."

One answer that may readily come to prevent the organisation of such a separate unit is that it will involve unnecessary additional expenditure. This need not necessarily be so. The Assistant Registrars and Deputy Registrars are already handing out information to this new unit to enable it to discharge the functions assigned to it. In the process of drawing up plans for this purpose the present handicaps and difficulties that are being faced by these functionaries would come to the surface. This apart a certain amount of coordination would be required on the part of the new unit. All this is bound to reflect in the more efficient functioning of the organisation. As such this alone should amply justify the expenses incurred.

A wide variety of media like the Press, the Radio the Television are now open to the universities to use to their best advantage. A trained head of such a unit can exploit these new media to a great extent. It would also relieve the senior administrators of much of the routine public relations functions.

Apart from projecting a better image of the Indian university to the world at large in order to win support for the institution, it would go a long way in bridging the communications gap that now exists on the Indian University scene.

Visitor's Enquiry Committee

Some Thoughts

R. P. PURI

EVEN though statutorily the visitor is neither an officer nor an 'authority', certain rights and powers have been conferred on him under Acts and Statutes of central universities. He is not answerable to any authority of the university. In spite of occupying a position of pre-eminence, it would be wrong to describe the Visitor as a super power especially when he is morally committed to ensure its smooth functioning.

Among the Visitor's powers, the one relating to his right to institute an enquiry into the affairs of a university is of great significance. He can exercise this power, in relation to examinations, teaching and other work conducted by the university. The enquiry which can also be conducted into *any matter* connected with the university seems lately to have widened its scope by bringing the university administration and its finances under its purview. The reasons for this are not far to seek. If the administration and finances of a university are in a state of good health, it has no cause to worry itself. Though such a sweeping statement may not be entirely true, the fact remains that the 'administration' is invariably held responsible for mismanagement. To hold the administrators squarely responsible for the disarray will tantamount to be ungenerous to them. On the other hand, academics and laymen connected with the university will equally have to share the responsibility. They ought to be answerable to the public for the deteriorating state of affairs. Any enquiry instituted under the Visitor's orders could well be construed as some kind of assessment of the ability and interest with which the academics and the lay members fulfil their responsibility in administering the affairs of the University.

In terms of India's Constitution, the President is

The author is Assistant Registrar, Jawaharlal Nehru University.

supposed to act with "the aid and advice" of his Council of Ministers. It follows that as the Visitor of a university, he will, too, have to seek the advice of the Minister in charge of university affairs. Apparently, therefore, the appointment of an enquiry committee by the Visitor could imply political interference in the internal affairs of the university.

In one of the Central Universities Act, the Visitor has been empowered to appoint 'one or more persons to review the work and progress of the university and to submit a report thereon'. Thus the statutory provision that the Visitor shall appoint an enquiry committee (understandably on ministerial advice) can be used to show that Government is trying to wreck the autonomy of the university.

If the deficiencies pointed out to a university in its working from time to time are allowed to accumulate without any remedial steps being taken in time to effect improvement in its working, the situation will become more dangerous. Such an unenviable position for the university can however be avoided if it tries to live in a disciplined way.

The desire of our universities to maintain their autonomy is justified if they scrupulously follow the course which would take them to their cherished destination. What is to be done to achieve this objective? The answer is obvious. They should themselves rigorously evaluate their own performance. The concept of self-examination which should be incorporated in the statutes of the universities so that the process of self-evaluation becomes inevitable should be experimented at the earliest opportunity.

A periodic review of the activities of an institution enables it to shake off its complacency and make it responsive to the reasonable expectations of the larger community. Nehru said in 1947: "If the universities discharge their duties adequately then it

is well with the nation and the people". It is unfortunate that these nice words have had little practical impact on our universities. It has been our stock practice that an enquiry into the affairs of any of our institutions should as far as possible be conducted by those not connected with it.

The responsibility of appointing an enquiry committee should devolve on the university itself by making provision to this effect in statutes. Its membership should consist not only of academics and laymen, but also of one or two students who have been in the university for more than two years. Thus, we will have a committee representing lay members, the university's own academics and students, and one or two other educationists from outside the university but serving on any of its authorities. Since all the persons are associated with the university's affairs in one way or the other, the committee will be probing into its own acts of omission and commission. It could be characterized as a novel experiment in our own country, but it is not so in universities abroad. During the last five years, about six universities in the United Kingdom (Birmingham, Leeds, London, Open, Oxford and Sussex) appointed review committees to consider various aspects of the working of university administration. And, almost in all the cases, the membership was largely drawn from among the academics of the respective universities.

The members of the enquiry committee we have in view should be nominated by the Visitor, the Executive Council, the Academic Council, and the Students' Union. The registrar of the University should be its Member-Secretary. The persons to be nominated by the Visitor should be a retired Supreme Court/Senior High Court Judge preferably with some previous background of university teaching or administration. He should be the Chairman of the Committee. The terms of reference of the Committee should be so wide as to cover all aspects of the working of the university. Besides this, the Committee should thoroughly examine whether the objectives of the university embodied in statutes are being achieved, and, if so, to what extent.

The report submitted by the committee should be placed before the joint session of the Court, the Executive Council and the Academic Council. The views expressed at this meeting on the report should be forwarded to the Visitor. The Visitor will have the right to make comments on the report. His comments as well as those expressed at the joint meeting should be communicated to the Executive Council and the Academic Council through the Vice-Chancellor to enable these authorities to take appropriate and expeditious action on matters falling within their respective jurisdiction.

The periodicity of the review of the working of the university is also an important matter. A quinquennial period appears to be quite reasonable. It could, however, be argued that this is too short a period for a newly established university to get ready for the review of its working. Conceding this point of view, we may at the most extend the period by

two more years. But that will make matters more complicated. The Vice-Chancellor's term of appointment is five years. It is necessary that he should be available for any explanation or clarification which becomes necessary in the course of the investigation. Moreover, a five-year period is crucial enough in the life of a university. As regards a newly established university, it is said it is the time when the university "rolls in money." Most of its financial needs are given favourable consideration and all efforts are made to make its functioning smooth. It is in a stage of infancy, a developing state. Therefore, all the care which is due to an infant is usually accorded to the newly set up university. It has complete freedom in chartering its course. Deviation from the established conventions and other directives that might have been issued by the University Grants Commission or the Central Government is permitted to a substantial extent, enabling the university to develop itself unhampered. If after having grown in such a congenial and patronising atmosphere, its progress is still not adequate at the end of the five-year period, naturally people would be inclined to believe that the university failed to make proper use of the facilities afforded to it.

Another inherent advantage of cultivating the habit of self-assessment lies in the fact that those who are at the helm of affairs of the university will become planning conscious. Unforeseen circumstances require urgent attention, and the racking up of minds should become a way of life with the university administrators. They must anticipate things and should, as a rule, be planning-minded. The planning process will also ensure that more thought is given to decision-making.

The five-year period of review will also enable our universities to take stock of and to evaluate their work and then to prepare some kind of a blue-print for the next five year period. An accurate analysis of resources, past achievements, present situation and future goals will take us to realistic planning and it is what is lacking in our universities. Viewed in this perspective, the need of planning on the part of our universities is still greater, partly because of the longer period involved in most areas of university activity, and partly because the impact of their activities is felt years later. No university will then dare to take on-the-spot or *ad hoc* decisions on such matters as the introduction of a new course in a particular discipline of study or effecting a new grouping of courses, because all this requires an evaluation of the student demand for several years ahead.

Also, complete dependence of our universities on Government funds, both for their maintenance and for their development activities, leaves no alternative but to resort to planning, just as there is no option to change. Furthermore, the concept of planning is also gaining ground for the reason that while our requirement of funds is large, their supply is scarce. Thus universities cannot avoid to have recourse to planning when it is increasing in our national system within which our educational institutions have to operate.

Workshop on Higher Education

MADURAI UNIVERSITY conducted a 3-day Workshop on 'Autonomous Colleges, Examination Reform and Development of Post-graduate Education', on July 25, 26 and 27, 1974, on behalf of the University Grants Commission. 5 Vice-Chancellors, 3 Directors of Collegiate Education, 12 Principals, 25 Professors and 6 students, representing a good cross-section of the academic community in the four Southern States of Andhra, Karnataka, Kerala and Tamil Nadu participated in the Workshop. The Vice-Chairman of UGC, Dr. Satish Chandra, and three of his colleagues from the UGC also attended the Workshop. Members of the Steering Committee for the Workshop, consisted of Dr. M. Varadarajan, Vice-Chancellor of Madurai University, Dr. M. A. Thangaraj, Principal of American College and Dr. S. Krishnaswamy, Head of the Biology Department.

Autonomous Colleges, Examination Reforms, Development of Post-graduate Education

FIRST of four Regional Workshops planned by UGC, the Madurai Workshop tackled with all sincerity and seriousness the three topics 'Autonomous Colleges, Examination Reforms and Development of Post-graduate Education', one on each day.

Some of the major conclusions and recommendations of the Workshop are as follows:

Autonomous Colleges

The idea of establishing autonomous colleges is to be welcomed whole-heartedly, as it gives scope for innovation and experimentation in higher education by carefully selected colleges which are noted for their past record and performance, quality of staff and potential for growth. They should be encouraged to introduce courses and curricula which would be creative, purposeful and relevant to Society, needs. The total strength of such a college should be about 1000 in the degree classes, including about 300 at the post-graduate level.

The autonomous college should have the freedom to devise its own courses, conduct its own Examinations and tests and make its own admissions and appointments. However, in all these functions, the College would be assisted by experts from the University and elsewhere. Specifically, it is recommended that the Governing Board of the college should include, in addition to the nominees of the management, staff and student representation, a representative each from the university and the state government (Education Department). If a government college is to become autonomous (a) it should have a pro-

perly constituted governing board consisting of the Director of Collegiate Education, the Principal and a Senior Professor of the College and a University Representative; (b) normally the faculty should not be transferred from the College.

It is also recommended that the Appointments Committee, Academic Council and Boards of Studies should have professors from the University as full members. The university may also appoint a Committee to review the progress of the college once in three years or five years. Also, it is to be remembered that the grant of autonomy is always subject to review and it can be withdrawn whenever there is abuse or decline of standards.

When colleges are ready and willing to accept autonomy, the university should take the initiative and (a) recommend them to the UGC for autonomy; (b) amend the university regulations to include autonomous colleges within its jurisdiction and (c) request the state government to amend its university Act suitably to include autonomous colleges.

Colleges which wish to become autonomous should undertake a thorough self-study programme in order to indentify their strengths and weaknesses and determine the direction in which they would like to develop under autonomy. This would enable them to indentify the areas in which they would want to be innovative, and the facilities and financial assistance which they would need for their development.

The areas which may involve additional expenditure are likely to be; staff retraining; part-time specialized staff; examiners' remuneration; improvement

of physical facilities, and modernisation and improvement of laboratory and library facilities.

Remedial courses for first generation learners and students from backward and weaker sections of society should be given priority.

The state government and UGC should come forward to assist the autonomous colleges in a big way in order to enable them to have a viable programme especially during the first few years of autonomy. The Colleges, on their part, should make every effort to generate income through fund-raising programme, through direct collaboration with local industrial establishments, and by utilising their laboratory facilities and technical know-how for fabricating simple equipment and servicing the instruments of smaller industrial concerns, etc.

The faculty in an autonomous college should be enabled to have sabbatical leave and opportunities of in-service training for their own quality improvement. Private tuitions by the faculty should not be permitted.

II Examination Reforms

Whether Colleges become autonomous or not, reforms in our evaluation methods are long overdue.

It is recommended that the Semester system should be followed, using effective teaching method applying modern methods of educational technology. Teaching and evaluation should go hand in hand, and therefore continued evaluation by the teacher should become normal, in addition to an External Examination at the end of the Semester. As a matter of policy, the Semester system may be introduced first at the Post-graduate, Professional and autonomous colleges levels, and gradually extended to all the classes in the affiliated colleges.

In introducing the Internal Assessment, proper checks should be built into the system to eliminate its misuse. All papers should be returned after valuation, and marks published on the notice board. If the student feels dis-satisfied with the valuation of his paper, he may seek clarification from the teacher concerned. If he is still not satisfied he may go to the Head of the Department, and if still dis-satisfied he should have recourse to a Review Committee. Complete openness on the part of the teacher and opportunities for review of the valuation, should remove much of the misgiving about the misuse of internal assessment.

It is recommended that the Internal Evaluation marks and those of the External Evaluation may be shown separately.

In subjects where practical work is involved, the students' performance may be continuously evaluated and records kept. These and the facilities available would be checked periodically by a Review Committee appointed by the university. The Practical Examinations of the present type may be given up.

Before introducing the Semester System, Internal Assessment etc., the teachers should be prepared adequately through workshops and students through orientation courses about these procedures.

Various types of test should be employed to assess the student-objective type, multiple choice, short answer, essay type, problems of graded toughness, open book, take home exercises and so on. The question papers should contain sections which should test the candidate's knowledge, understanding and ability to apply the knowledge to solve problems.

It is important that Questions Banks be set up at different levels on an all India basis which would be built up by inviting questions from teachers, screened by experts, tried at various centres and graded according to their efficacy.

It is also recommended that a suitable method be devised for the assessment of teachers by the students as well as by the colleagues. A comprehensive proforma should be prepared and given to students for an anonymous assessment of the teacher on his academic performance. Such assessments should be kept confidential, except that they may be seen by the teacher himself, the Head of the Department and Principal, for taking corrective measures.

III Development for Post-graduate Education and Research

It is strongly recommended that all post-graduate teachers should have research qualification and should be research-oriented. They should have some original work in addition to teaching. It was felt that their work should be reviewed every three years and incentives given for good work done. The management, the state government and UGC should extend adequate help to provide the necessary facilities for original work to be done in all post-graduate departments. This should be a condition for granting affiliation for PG courses.

It is recommended that the university should adopt a policy of dispersing the Post-graduate courses of study and Postgraduate centres to areas where such courses are needed and would make the greatest impact.

Setting up of academic centres with core staff and requisite facilities to co-ordinate and maintain high standards in post-graduate colleges, districtwise may be given priority.

The courses offered should be flexible and have a set of core-courses and electives from which a candidate can make his choice. Inter-Collegiate and college-university cooperation in teaching should be encouraged.

The post-graduate course should include some component of project/research work by the student at the senior level, in place of the conventional, repetitive type of practical work, so as to introduce the student to the methodology of research.

Genuine efforts should be made by the Science PG Departments to establish collaboration with local industrial establishments in order to undertake to solve some of their problems in the college laboratory, thereby giving practical training to students and staff in tackling real life problems and to utilise the facilities of the laboratory and the technical know-how of the faculty to the fullest. ●

Changing Character Of Universities

In India

D. K. GHOSH

FROM traditional Universities aimed at Universality of subjects, Universities devoted to specialised studies in Engineering, Science and Architecture, were introduced only after 1948. Roorkee University, Agricultural Universities, University of Music and Fine Arts (Indira Kala Sangeet University), Ayurveda University and Sanskrit University are such cases. The establishment of such specialised Universities made a marked change in the character of Universities and removed the wrong notion that a University means a *Universitas facultatum*—a school in which all faculties or branches of knowledge are represented. The idea of having a National Peoples University i.e. Open University proposed in India on the lines of such a University of U.K. established in 1969, will surely break new ground. The establishment of the United Nations University with a Centre in India will be a new experiment in the international field. These new experiments to meet new situations including those on "pressing global problems" mark distinctive changes in the character of Universities.

With the passage of time, and in keeping with the needs of the society, Education is shaped and re-shaped—be it the Ancient, Medieval or Modern time, Education and Society are meant only to co-exist for each other. While Education amplifies Society, Society in turn strengthens Education.

Earliest Universities

Though the word 'University' owes its origin to the medieval Latin word '*Universitas*', in Ancient India, from the Buddhist period, organised institutions were founded and some of those big institutions rose to the status of Universities. The pattern of education had drawn the inspiration from the principles of Buddhism which had been founded on republican principles under which 'Dharmma' was preached to the masses in their own language. This inspired establishment of organised institutions known as 'Viharas'. Of various Viharas, the Taxila and Nalanda prominently rose to the status of Universities drawing students from various parts of the country and abroad, e.g. China, Japan etc.

Teaching in such ancient institution was open to those students admitted to the Viharas, on attaining the age of 16 years. These viharas had good residential buildings and hostels which enabled a large number of students and teachers to live in the Uni-

versity Campus and helped in develop a corporate life.

Nalanda, Taxila and other such centres of higher learning of the Buddhist period which made unparalleled contributions to the evolution, expansion and refinement of Indian Culture, brutally destroyed at the hands of the Mohammedan invaders. Since then, to the early period of the arrival of Britishers, the education was mainly in the hands of the Muslim Rulers. Besides Madrasahs, Ashramas and Tols of Bengal were also parts of the system of education.

Modern Universities

As a result of the famous despatch of the Court of Directors sent to the Governor-General in India, three Universities, one each at Bombay, Calcutta and Madras were established on the 24th January, 1857, along the lines of the then London University "for the purpose of ascertaining, by means of examinations, the persons who have acquired proficiency in different branches of Literature, Science and Art and of rewarding them Academical Degrees".

The character of these first three modern universities, was only examining & affiliating. Teaching and research which are now considered to be the primary objects of universities were none of their functions. These universities, in the first instance functioned as organisations to lay down courses, affiliate institutions and conduct examinations which were entirely different from the concept of universities of not only of today, but even of the universities of Oxford and Cambridge as they were then. Expressing his sense of surprise to the character of the Indian universities then, Lord Curzon, on taking over as the Viceroy of India, remarked: "How different is India! Here the University has no corporate existence in the same (i.e. as in Oxford and Cambridge) sense of the term; it is not the collection of buildings, it is scarcely even a site. It is a body that controls courses of study and sets examination papers to the pupils of affiliated colleges. They are not part of it. They are frequently not in the same city, sometime not in the same province".

But as days passed by, under new situations developed as a result of emergence of the Indian National Congress and a demand to have a National Education as also to meet the political ends of the British Government, the educational policy was re-shaped. Consequent upon the recommendations of the Commission appointed in 1902, to examine the working of the Universities, the Indian University Act No. VII of 1904 was passed which provided that the Universities should make "provision for the instruction of students with power to appoint University Professors and Lecturers". This brought about a significant change in the character of Indian Universities.

By and by, more universities were established.

The total number of Universities in the pre-independence period rose to 19, which has now risen to 95.

During the pre-independence period, the Universities could be grouped as

(1) Affiliating	1
(2) Affiliating-cum-Teaching	10
(3) Federal	2
(4) Unitary	6

In the Post-independence period, the number of Universities has risen considerably. In a period of 26 years, (1947-1974), the number of universities established is 76. Besides, there are 9 Institutions which are deemed Universities. While in the post independence period also, the characters of new Universities were mainly the same as those of the pre-independence period, the most significant change in the character has been that having realized the need for specialised studies in the context of the fast changing situation Universities have been established for specialised studies and research. Names of Roorkee University for Engineering Studies, Indira Kala Sangit Vishwavidyalaya, Khairagarh (M.P.) for studies of Music & Fine Arts Studies, Varanaseya Sanskrit Vishwavidyalaya for Sanskrit Studies and Agricultural University in each of the States may be mentioned. The old idea of a University to mean Universality of subjects has disappeared with the change of time. The All India Institutes of Technology at Bombay, Delhi, Madras, Kanpur and Kharagpur for technological studies and the All India Institute of Medical Sciences, New Delhi, for studies of medical sciences are of the status of University.

The opening of a number of Universities has certainly lessened the crowd of students and enabled larger number of students to take part in the university life.

Open University

In the present context of changing conditions in the world, baffled with economic crisis we need to explore new methods of teaching and learning. The proposal to have a National Peoples University on lines of the Open University of U.K. is commendable. United Kingdom has surely broken new ground by establishing an Open University. Doubts have, however, been expressed as to whether the proposed Open University in India would be a successful experiment.

The Open University of U.K. offers courses through Radio and Television. Tape Recordings are also provided in Study-Centres as also summer Schools. These facilities are pre-requisites for the Open University. The Courses are based on the credit system and designed for those "precluded from achieving their aims through an existing institutions of higher Education".

Such an Open University can successfully fully work in India if only it is established after careful planning so as to suit the Indian requirements provided it is fully financed by the Central Government,

U.N. University

In the world of higher learning, the establishment of the United Nations University, sponsored by the United Nations Educational Scientific and

Cultural Organisation (UNESCO) is a unique innovative experience. It will be different from the conventional University. The idea of this University was given by the the former Secretary-General of UNO—U.Thant, in 1969.

The character of the University aims at creating an 'International Community of Scholars, engaged in research, postgraduate training and dissemination of knowledge in furtherance of the purposes and principles of the charter of the United Nations'. Its major functions will be - (a) to disseminate knowledge; (b) to exchange academic personnel; (c) to organise internationally coordinated research and (d) to generate catalytic ideas. In true sense it will function as an International University. It will also assist the existing Universities and research Centres in their programmes of modernisation. It is expected to promote action oriented multi-disciplinary studies on "pressing global problems" which will include study of international relations and peace; problems of development; the influence of science and technology on the environment and quality of life. Though some of these subjects are already being studied in a number of existing Institutions; the United Nations University will approach them from truly global stand point. The following institutes are to be organised.

- (1) Institute for Desert Research.
- (2) Institute for Basic Science.
- (3) Institute for Human Rights.
- (4) Institute for National Resources.
- (5) Institute for Petroleum Studies.
- (6) Institute for a Comparative Study of Development.

Finance

The sources of income of the University will be voluntary contributions from various governments and non-government sources. Japan has offered a contribution of \$ 100 millions to the Endowment Fund of the University and will also pay for the capital cost of establishing the University centre in Tokyo. So far, more than 25 governments including India have agreed to be associated with the University, either by establishing an Institute as part of the University or by making financial contributions.

Organisation

The University will be headed by a Rector who will be responsible to the University Council for "direction, administration, programming and co-ordination". A University Centre will be located in Tokyo. India will also have a centre and the former Vice-Chancellor of the Jawaharlal Nehru University has been appointed as a Member of a Council of the University.

In the context of the present rapid industrial development and the keen competition among nations for projection of superiority of scientific development which has been overshadowing the other needs of the human race necessary for maintenance of balance, the establishment of the United Nations University augurs well for the welfare of the mankind which will have jurisdiction all over the world and will thus have scope to co-ordinate the activities of the world academic community.

Panjab University

Major Trends in Financing

V. P. GARG

THE size of the University of Panjab has grown from 27.6 thousand students in 1950-51 to 97.7 thousand students in 1966-67. The total expenditure has increased from Rs. 87.7 lakhs to Rs. 8.8 crore during the same period. It is clear that while the enrolment has become four-fold, expenditure on the University departments, constituent and affiliated colleges taken together has become ten times. In relation to all Universities, the share of Panjab University expenditure has gone up from 4.86 to 4.96 per cent during the 18 years under review. However, for individual years it is observed that the share of the Panjab University in the All Indian University expenditure has increased consistently upwards to 8.3 per cent in 1960-61 and thereafter it has declined linearly to 4.9 per cent in 1965-66. For the year 1969-70 the total expenditure has gone upto Rs. 13.98 crores. This gives clear indication that Panjab University's finances should be studied more closely from the point of view of raising funds from the highly elastic sources. An attempt has been made to study income-expenditure relationship, structural changes and sources of finance, and the increase in cost per pupil during 1950-51 to 1966-67.

Income Expenditure

Table I gives growth in income and expenditure relationship of the Panjab University from 1950-51 to 1966-67.

* Author is Research Fellow of the Panjab University. He greatly acknowledges the help given by Dr. H.N. Pandit in the preparation of this article.

TABLE-I

Growth in Income and Expenditure of Universities of Punjab

(Amount in lakhs of Rs.)

S. No.	Year	Income	Expenditure	Difference
1	2	3	4	5
1.	1950-51	90.90	87.71	+3.19
2.	1952-53	160.85	178.59	-17.74
3.	1955-56	288.83	282.49	+6.34
4.	1958-59	472.50	458.11	+14.39
5.	1961-62	543.04	573.30	-30.25
6.	1964-65	644.31	629.84	+14.47
7.	1966-67	891.10	878.86	+12.24
8.	Annual Growth Rate	15.3	13.8	

The actual aggregate income and expenditure figures have been shown against 1950-51 and thereafter, three yearly average figures have been shown centred around their mid-years for the three Five Year Plan periods. Incidentally, the same procedure has been followed in presenting figures in subsequent tables.

It is seen that while the income has increased at an annual rate of 15.3 per cent, expenditure has increased at 13.8 per cent only. It is thus clear that

TABLE 2

Structural Changes in the Expenditure Pattern of the Universities, 1955-56 and 1964-65

S. No.	Sector	Panjab		All Universities	
		1955-56	1964-65	1955-56	1964-65
1	2	3	4	5	6
1. Salaries		44.42	43.61	42.79	41.96
(a) Teaching Staff		29.38	31.41	31.50	30.85
(b) Non-Teaching Staff		15.04	12.20	11.29	11.11
2. Scholarships and Stipends		6.20	7.25	7.43	9.81
3. Examination		9.64	9.21	4.23	3.29
4. Games and Sports		2.11	1.28	1.04	0.58
5. Hostels		1.26	1.32	2.11	1.30
6. Library		1.99	4.11	1.71	3.75
(a) Capital Expenditure		—	1.51	—	1.39
(b) Current Expenditure		1.99	2.60	1.71	2.36
7. Building		15.79	9.41	11.23	13.95
(a) Capital Expenditure		13.02	8.50	9.45	13.05
(b) Current Expenditure		2.77	0.91	1.78	0.87
8. Equipment, Apparatus, Furniture and Stores		9.05	9.28	10.50	10.41
(a) Capital Expenditure		2.36	2.23	4.23	5.06
(b) Current Expenditure		6.69	7.05	6.27	5.35
9. Unspecified		9.53	14.53	18.95	14.97
(a) Capital Expenditure		1.99	2.65	6.46	2.90
(b) Current Expenditure		7.54	11.88	12.49	12.07
Total: Per cent		10.00	100.00	100.00	100.00
Amount (in crores of Rs.)		2.82	6.30	36.67	131.23
Capital Expenditure as Percentage of Total Expenditure		17.38	14.89	20.14	22.41

TABLE 4

Growth in Cost Per Student Year in the Panjab University 1950-51 to 1966-67

S. No.	Year	Panjab		All Universities	
		Amount (in Rs.)	Growth rate	Amount (in Rs.)	Growth Rate
(1)	(2)	(3)	(4)	(5)	(6)
1.	1950-51	298.27	—	417.00	—
2.	1952-53	456.78	+23.8	475.59	+6.8
3.	1955-56	495.72	+2.8	488.65	+0.9
4.	1958-59	519.91	+1.6	556.21	+4.4
5.	1961-62	695.22	+10.1	665.93	+6.0
6.	1964-65	798.42	+4.7	774.99	+5.2
7.	1966-67	799.23	+0.1	832.48	+3.7

the University has shown surpluses during the Second and Third Five Year Plans.

STRUCTURAL CHANGES

Changes in the structural of expenditure are shown in Table 2. (See Page 13). It is seen from the table that the share of salaries has gone down from 44.42 per cent in 1955-56 to 43.61 per cent in 1964-65. The Library expenditure has gone up from 1.99 to 4.11 per cent during the same period. Expenditure on the buildings has gone down from 15.79 to 9.41 per cent. Expenditure on equipments has remained constant. The unspecified items have shown increase from 9.53 to 14.53 per cent. Expenditure incurred on examinations has also shown a marginal decline from 9.64 to 9.21 per cent. So is the case on games and sports. This can be said to be unfortunate trend, when we regard games and sports as an essential part of personality development among youth. The

share of games and sports in the overall expenditure is very low. Even then its percentage share has declined considerably from 2.11 per cent in 1955-56 to 1.28 per cent in 1964-65. This tendency is also visible in all Indian Universities. In case of scholarship and stipends there was marginal improvement i.e. from 6.20 per cent in 1955-56 to 7.25 per cent in 1964-65. It is a 'healthy trend' from the point of view of a student's welfare.

Sources of Finances:—The changes in the contribution of different sources is given in Table 3. (Given below). Obviously the fees contributed 47.22 per cent of the total sources of expenditure of the University compared to 29.02 per cent in case of all Indian Universities. The income from this source has been constant over the period under discussion. The contribution of the Central Government for financing the University expenditure has nearly doubled in the relative terms from 9.25 per cent in 1955-56 to 16.66

TABLE 3

Changes in the Sources of Expenditure of the Universities, 1955-56 and 1964-65

S. No.	Source	Panjab		All Universities	
		1955-56	1964-65	1955-56	1964-65
1	2	3	4	5	6
1. Central Government		9.25	16.66	14.67	22.23
	(a) Current Expenditure	5.83	8.65	8.36	13.18
	(b) Capital Expenditure	3.42	8.01	6.31	0.05
2. State Governments		26.24	25.29	35.25	38.10
	(a) Current Expenditure	22.20	21.90	28.15	31.98
	(b) Capital Expenditure	4.04	3.39	7.10	6.12
3. Fees					
	Current Expenditure	47.46	47.22	35.18	29.02
4. Endowment					
	Current Expenditure	1.55	1.65	1.39	0.73
5. Other Sources		15.50	9.18	13.51	9.32
	(a) Current Expenditure	8.22	6.30	7.03	6.09
	(b) Capital Expenditure	7.28	2.88	6.48	3.83
6. Total Per cent		100.00	100.00	100.00	100.00

percent in 1964-65. The share of the State Government has declined from 26.24 to 25.29 per cent during the same period. The share of the State Government in both the current and capital expenditure has gone down, whereas the share of the Central Government has shown a substantial increase in both types of expenditure. It is a point worth noting that the share of the State Government showed a decline in this University whereas in the case of all Indian Universities it is on the increase and is of great magnitude i.e. 38.10 per cent in 1964-65. It becomes clear from this analysis that University is leaning heavily on U.G.C. and Central Government for meeting its expenses. The contribution from the endowments improved a little from 1.55 to 1.65 per cent under the decade. Income from other sources had a steep fall from 15.50 per cent in 1955-56 to 9.18 per cent. This tendency is also found in all Indian Universities.

Cost per student year:—Increase in the recurring expenditure per student year is given in Table 4. (See page 13) There is constant increase in cost per year. Taking 1950-51 as base year, the cost per student in the Panjab University increased from Rs. 298.27 to Rs. 799.23 in 1966-67.

When all Universities taken together, this cost increased from Rs. 417.09 in 1950-51 to Rs. 832.48 in 1966-67. In the beginning of the Plan era, the recurring cost in the Panjab University was nearly half of the all Indian Universities average but with the advancements of years it ran in close to all Indian Universities level. It becomes obvious from the Table 4 that there have been "erratic trends" in the cost per student year in the Panjab University during the last 18 years compared to 'normal' rate of increase in all Indian Universities. Thus, there is a need for depth study for identifying the factors responsible for such trends.

It can be concluded that financing pattern, structural changes in the expenditure, of the Panjab Uni-

versity has gone under a substantial change. The capital formation in terms of buildings, libraries, equipment and stores etc. (both for capital and current expenditure) has lagged behind when all Universities taken together in India. In other words, it means that facilities for students in relation to the size of University have been poor.

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University News

Round Up

'Basic Change In Exam System'

The Saurashtra University arranged a seminar on 'The Basic Changes in the Examination System' at Bhavnagar on July 14. In the first session the following papers were presented—

- (1) Curriculum improvement and Teaching Methods by Principal M. D. Vaisnav.
- (2) Examination and Evaluation System by Dr. H. G. Desai.
- (3) Assessment of Answer Book and Scaling of result by Principal M. D. Trivedi.

Some of the Valuable suggestions made by the participants are.

1. It is only with the full cooperation of the teachers endowed with knowledge, self confidence, sincerity and honesty of the purpose by which any changes can be brought into existence and can be implemented.
2. The Syllabus and the examinations are interwoven and cannot be separated. If any changes in the examination system are required it first should be made in the Syllabus which is taught to the students.
3. There should be different methods of evaluation—Open book test, Take home test, Make-up test,

Extra credit, Comprehensive examinations etc.

4. Examination Research Cell should be established in the University.
5. Scientific methods of setting the question paper should be understood by the teachers who set the question papers. The Paper-setters should prepare the details of the evaluation system along with the setting of the question paper. A complete marking scheme should also be fixed. It would be better if they submit a model answer paper.
6. 4 to 5 question papers should be set in the same subject by five different paper-setters and one of these should be set in the examination hall.
7. The first year and the second year examination of the three-year degree course should be conducted by the colleges and only the final examination be conducted by the University. However the Pre-University examination be continued to be held by the University.
8. Question banks should be prepared on the basis of different topics of the syllabus prescribed in details by the Board of Studies.

9. A Correspondance course should be introduced.
10. The system of morning colleges should be stopped.
11. Instead of written examination the following system should be adopted, subjectwise and paperwise :—
 1. Viva-Voce... 25 Marks
 2. Objective tests by the University 25 Marks
 3. Internal Evaluation by the colleges 25 Marks
 4. Term work to be done by the students during the year... 25 Marks
12. The system of giving classes at the examination results should be replaced by grade system.
13. The number of tutorials should be increased and that of lectures should be reduced.
14. Orientation programmes for teachers should be organised.
15. The scheme of moderation of question papers should be introduced.

Student Interne Programme At U.N.

Thirty-three participants from 21 countries are taking part in a four-week Student Interne Programme at United Nations Headquarters which began on 29 July. The purpose of the Programme is to provide an opportunity for the participants to deepen their understanding of the principles, purposes and activities of the United Nations and its related agencies through first-hand observation and study.

The Interne Programme which is organized annually by the Office of Public Information (OPI) is open to a limited number of university students on

the graduate level. These young men and women from different countries are specializing in subject fields related to the work of the United Nations, such as: international relations, government, political science, law and economic and social affairs.

The Programme will include briefings by senior officials of the United Nations Secretariat, panel discussions and attendance at meetings of the United Nations bodies which are in session during that period. In addition, the Internes will be assigned to work individually alongside United Nations staff members in various departments according to their respective fields of study.

Participants come from the following 21 countries: Afghanistan, Australia, Belgium, Brazil, Canada, Ethiopia, Finland, Federal Republic of Germany, Ghana, Guatemala, Guinea-Bissau, Iceland, Iran, Japan, Kenya, Libya, New Zealand, Nigeria, Sweden, Tunisia and the United States.

Novel Experiment Of Kerala Students Union

A SURVEY of the socio-economic conditions of college students and their attitude towards studies and politics is proposed to be undertaken by the Kerala University Union. Mr. Philipose Thomas, Union President, told pressmen that a provision of Rs. 2,500 had been made for the survey in the Union's budget for this year. Assistance from the Planning Commission by way of grant was expected for the survey.

He said a university level committee had been formed for organising the survey and that technical assistance of the Centre for Development Studies in Trivandrum and co-operation of the Calicut University Union were being sought for conducting a State-wide survey.

The union's Rs. 1.35 lakh budget for 1973-74 contains a

provisions of Rs. 10,000 for conducting a four-day "Sarga Samvad" camp for students of creative talent from August 9. About 60 students, writers, singers, painters, actors and dancers will be selected for this camp and some 30 senior artistes in the corresponding fields will also stay with them in the camp. The dialogue between recognised

U. N. Varsity

The United Nations University should begin operations next year after the University Centre comes into existence in December, by which time it is hoped a Rector of the University will have been selected by the University Council. This was announced in Paris after the Council had completed its second session at UNESCO's headquarters from 9 to 12 July.

The nominating committee of the Council will meet again in Paris in September to submit a short list of between three and five candidates for the post of Rector for the approval of the Council. The Secretary-General of the United Nations and the Director-General of the UNESCO are members of the Council and the two organisations are joint sponsors of the graduate-level institution directed at study of the pressing problems of mankind.

Japan is so far the only country to offer a financial contribution to the endowment fund of the UN University. This pledge of \$ 100 million was made in the expectations that other contributions will follow. Offers of academic co-operation have come from 26 other countries. Priority subjects for study by the UNU should be fixed by early next year when the University Council is expected to meet in Tokyo, site of the University Centre of the UNU, which is conceived as a network of integrated and associated institutions spread over many countries and particularly in the developing world.

and budding artistes will be the speciality of this camp. Formal classes and speeches will be reduced to the very minimum in the camp.

A university planning forum is also proposed to be organised as a co-ordinating body of the college planning forums. Under its auspices, a village will be adopted for intensive development.

Mr. Thomas said the university union had already set up a film club in Trivandrum and it was proposed to organise a chain of film clubs in colleges. The holding of a film festival and institution of a film appreciation course were also under consideration.

The Union is also exploring the possibility of arranging loan scholarships from banks to talented but needy students at the rate of Rs. 500 per student at the graduate level and Rs. 1,000 per student in the post-graduate level. The idea is to arrange loans to the tune of Rs. 5 lakhs for 50,000 students.

Mr. Thomas said the union would not incur any expenditure without complying with the university rules and it would be subject to the approval of the university and the State Government.

Regional Languages For Exams

The Union Public Service Commission have set up a strong research unit to keep tract of the developments in the use of regional languages by the Universities for their early introduction in the examination conducted by the Commission. This unit will undertake preparatory work for introduction of regional languages as media for optional papers in art and science subjects. This is stated in the 23rd Annual Report of the U.P.S.C.

The commission conducted during the year under review 18 examinations for recruitment to important organised civil services and posts. The Commission also held six written examinations for the Defence Services. The number of candidates who applied for admission to the various examinations was 70,961 as against 63,617 in the previous year. Of these, 7,137 belonged to scheduled castes and 1,183 to scheduled tribes. The number of candidates for the Indian Administrative Service Examination increased to 17,684, for the Engineering Services Examination to 6,232, for the Indian Forest Service Examination to 4,361 and for the Assistants' Grade Examination to 15,607.

More Range For Electric Cars

THE electric car may be on the brink of a technical breakthrough. Tests in Britain have shown that it is possible to extend the limited range of such vehicles between battery charges to at least 65 miles.

The Electricity Council in its annual report published recently says the technical viability of a new type of sodium-sulphur battery has been demonstrated in road trials. "The particular vehicle used was found to travel 65 miles on a single charge," says the report. "It is thus believed that a design of battery that can be mass-produced at an acceptable cost for passenger transport and commercial vehicles is feasible."

In order to exploit the research, the Electricity Council has formed a company in partnership with a battery manufacturer. The aim is to complete the development work and to manufacture or license the battery.

The Electricity Council is currently operating the first of a fleet of small electric cars it has ordered from Enfield Automotive Company, of the Isle of Wight (Southern England).

'Middle Ages' Offsprings In German Universities

GERMAN universities and colleges, like all institutions of their kind in Europe and America, have their roots in the university of the Middle Ages; as an autonomous institution independent of all public authority, and consisting of an association of professors and pupils for the study of theology and the liberal arts. It also served for the education of the intellectual elite of the clergy, jurists and physicians. As foundations of religious orders and secular and rulers and with papal and imperial sanction, the first German universities were first originated in Prague (1348), Heidelberg (1386) and Cologne (1388).

In the 1971-72 winter term, the number of students at the Federal Republic of Germany's

universities, teacher training colleges and theological colleges totalled 466,151. Of these, 395,552 were studying at universities and technical colleges, 69,211 at teacher training colleges, and 1,388 at theological colleges. At art academies there were 12,313 students. It is true that the number of places for students has also increased. In the 1971-72 winter term there were 43 universities and technical colleges.

Certain important changes have taken place in recent years as a result of many deficiencies and the consequent efforts at reform. Above all, merely from the point of view of numbers, the situation has improved. Between 1960 and 1970, 13 new establishments of higher learning were founded. Most of them have already started teaching operations.

Meanwhile, 1,540 million DM (Rs. 462 crores) has been invested in these new establishments wherein 80,000 students are to find new places. Over 200,000 additional places are to be created by 1975. Between 1961 and 1967 the total expenditure of the Federation and the Federal (States) on universities and colleges went up by 146.5 per cent.

The additional expenditure on education has benefited not only the extension and improvement of the establishments but also the students directly. Up to the beginning of the 1950s, the vast majority of students received no State allowance. In the 19th and early 20th centuries, the students—a few scholarship-holders apart—were almost exclusively sons and daughters of well-to-do parents. After the War, however, the number of students from families considerably less well-off materially rose rapidly. Since 1955, the Federation of Universities has been

PAU Admission

THE Master of Business Administration programme of the Punjab Agricultural University, Ludhiana is proving very popular. For 20 seats, the number of applications received was 253. At the undergraduate level, the B.V.Sc. and Animal Husbandry programme of the College of Veterinary Medicine attracted the largest number of candidates, 291 for 50 seats. Likewise in the B.Sc. (Agriculture) 4-year and 5-year Honours Courses there were 449 applications for 140 seats. College of Home Science received 313 applications for 160 seats.

The candidates admitted to post-graduate programme of Home Science College had the highest merit with 90 per cent marks. At the undergraduate level also the highest percentage was 86 per cent, for B.Sc. Home Science.

The post-graduate degree at PAU is awarded in 33 disciplines.

supporting talented and needy students under what is called the "Honnet Plan." In 1968, it was possible in this way to assist as many as some 20 per cent of all students attending universities and colleges. In 1971, the Federation, on the basis of the Federal Education Assistance Act, which has taken the place of the Honnet Plan, paid the full living costs of some 25 to 30 per cent of the students and part of those of 60 per cent. The largest amount a student could receive under this scheme was 420 DM (1260).

Anti Bacteria Drill For Eggs

Dr. V. D. Vadhera, Professor in the Microbiology Department of the Panjab University has discovered the mechanism by which bacteria enters egg shells. According to him bacteria did not 'eat' or 'drill' their way through the egg shells as is commonly believed, but 'push' their way through the two fibrous membranes beneath the shell. The eggs had a two-fold natural defence against bacteria—external productive barriers which prevented the entry of bacteria and internal protective or anti-bacterial agents which prevented the growth of any bacteria that got past the first barrier. Dr. Vadhera has undertaken extensive research involving better methods of preserving eggs at Panjab University. He has suggested the dipping of eggs in boiling water for 30 seconds to preserve them for up to three weeks. They could also be coated with oil or vaseline.

Prof. Joshi visits Texas

Prof. Rom Joshi, Principal of SIES College of Arts and Science, Sion, Bombay, is proceeding to the US as a visiting professor at the University of Texas. He will teach a course on politics in India and another course on international

politics of countries in the Indian sub-continent.

Prof. Joshi was invited by the same university earlier in 1966. His work on that occasion was so much appreciated that the Texas university students voted him as the best professor among 46 professors of political science in the university.

After finishing the assignment at Texas, Prof. Joshi will teach at another university before returning to the city by the beginning of the next academic year.

Training in Broiler Production

A ten week programme in broiler production was initiated on August 17, 1973 by T.N. Agril. University. 200 broiler chicks were supplied to two batches of Third Year B.Sc (Ag.) students. Each batch consisted of five students. The participants were given training in compounding the ration, grading and mixing the ingredients of broiler ration and management of the stock. The students had to construct the poultry-house and to attend to all the routine duties of management of the chicks from the first day till they attained 10 weeks of

Dr. Randhawa

Dr M. S. Randhawa, Vice-Chancellor of the Punjab Agricultural University has been appointed Chairman of the Committee of experts to advise the Indian Council of Agricultural Research on publicity and sales promotion efforts for scientific books bulletins and journals for dissemination of research results in the field of agriculture, animal husbandry and allied subjects.

age. To offset the increased cost of feed, and as an incentive, physical facilities such as building and equipments were provided free of cost. Broilers thus produced under the scheme were sold on dressed weight basis. Each participant of the first batch earned an income of Rs. 26.80 and each of the second batch Rs. 133.56. Owing to the poor growth rate of chicks and low rate per kg of dressed weight, the first batch did not earn as much as the second batch.

Students evinced keen interest in participating in the programme and they were more keen on undergoing intensive practical training in rearing broilers than on earning by the scheme.



"Do you think we could dare to change the syllabus half way through the course without taking the risk of students burning down the college?"

Full Autonomy For Colleges Favoured

—Dr. Kidwai

While addressing the Eleventh Annual Convocation of the Punjabi University, Patiala, Dr. A.R. Kidwai, Chairman, UPSC, expressed himself in favour of full autonomy for the universities to plan their work and life.

For education to be more relevant to meet the developmental requirements, it is the duty of the universities to see that the knowledge imparted to the young men is not merely bookish but it helps them to apply their knowledge to the solution of practical problems, he said.

The aim of real education should be to liberate the individual from the bondage of self and to project oneself into the world with pragmatic outlook. Education must develop creative skills, resourcefulness and managerial abilities.

The rapid socio-economic changes have made impact on and completely revolutionized the teaching of Social Sciences. In a developing country like ours, he said it is even more essential that the teaching courses in various disciplines are in conformity with the developmental requirements of the country.

While learning Physics, why one cannot have a course in applied aspects of electronics acoustics, optics, and instrumentation and after graduation utilise this knowledge for starting small scale industries under the self-employment scheme for which finances are available. From this point of view, engineers would be perhaps better off if they started industrial schemes on their own instead of depending on Government jobs.

Referring to the acute problem of educated unemployment, he said: The number of educated job-seekers at graduate and postgraduate levels whose names are enrolled with the Employment Exchanges is about 8 lakhs. The actual number may be far more because many educated people though not employed may not have registered their names. The result is that a large number of qualified scientists and technologists have migrated to Europe and U.S.A. for a gainful employment. What is wanted is a co-ordinated approach by all concerned for maximum utilisation of our available talents in the minimum possible time. The problem of mounting unemployment frustrates educated young men; and when this gets mixed up with other economic and political issues, there are outbursts of indiscipline and violence. Even with the limited jobs available in the country, a suitable mechanism could be evolved as a result of which jobs could be made available to qualified young men immediately after they have completed their education without spending a period of frustrating efforts while applying for similar posts in the Government and other organisations and repeatedly competing in examinations, tests and interviews.

He disclosed that instead of holding separately three examinations at graduate level for Indian Military Academy, Indian Navy, and Emergency and Short Service Commissions, the Central Government, in consultation with the Union Public Service Commission, are formulating a scheme of having a combined competitive examination for enrolment

in defence services twice a year. The anticipated number of vacancies to be filled through this examination will be around 800 every year.

Complimenting the university he said, it is especially remarkable how, within its statutory framework, this University is maintaining balance between scientific and humanistic studies. It has set up significant programmes for the development of Punjabi language and culture and has initiated well-planned measures for projecting Punjabi into the teaching system. Yet this is done not in any parochial spirit. Nor have modern science and technology been neglected. The University's curricular innovations, especially in the fields of Nuclear Physics, Space Science and Material Sciences and in vocational courses in technology as well as in public management is notable.

Personal

1. Shri B.S. Mathur has taken over as the Vice-Chancellor of Meerut University w.e.f. August 6, 1974.
2. Prin. A.R. Desai has taken over as Vice-Chancellor of South Gujarat University w.e.f. August 22, 1974.
3. Prof. Gurubax Singh of Banaras Hindu University has been appointed as Special Officer to organise the Central University at Hyderabad.
4. Dr. C. R. Krishnamurthi, Associate Professor in the University of British Columbia, Canada, has joined the Tamil Nadu Agricultural University as a Visiting Professor w.e.f. July 6, 1974.
5. Thiru K.N. Duraiswamy has been appointed Registrar of Tamil Nadu Agricultural University w.e.f. July 8, 1974.
6. Dr. Zile Singh has been appointed Registrar of Jawaharlal Nehru Krishi Vishwavidyalaya w.e.f. August 1, 1974.
7. Shri A.G. Sharma has been appointed Registrar of University of Indore w.e.f. August 19, 1974.

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III. RESEARCH IN PROGRESS

(A record of subjects taken up for research by scholars registered for doctoral degree with the Indian Universities during 1958-66).

Volume 1—Physical Sciences	Rs. 40.00
Volume 2—Biological Sciences	Rs. 35.00
Volume 3—Social Sciences	Rs. 32.00
Volume 4—Humanities	Rs. 50.00

INDIAN INSTITUTE OF TECHNOLOGY KANPUR IIT POST OFFICE KANPUR-208016

Advertisement No. 21/74

The Indian Institute of Technology, Kanpur invites applications for four faculty posts in the Department of Metallurgical Engineering.

Recruitment will be made in the general field of Metallurgy, i.e. Physical and Process Metallurgy and Ceramics and Mineral Engineering.

To be eligible, a candidate must have a good academic record with doctorate and experience and interest in Research and Teaching for both undergraduate and postgraduate levels having specialisation in the following fields will be given preference.

1. Iron & steelmaking and Heat & mass transfer.
2. Mechanical working.
3. High Temperature & Nuclear Materials.
4. Magnetic & electronic materials.
5. Corrosion.
6. Phase Transformation.

The selection committee may relax any of the above requirements for the posts in exceptional cases.

Depending on the qualifications and experience, candidates will be offered any one of the following positions :

1. ASSISTANT PROFESSOR
Existing Scale : Rs. 700-50-1250
Likely to be revised to : Rs. 1200-50-1300-50-1900
2. LECTURERS :
Existing Scale : Rs. 400-40-800-50-950
Likely to be revised to : Rs. 700-40-1100-50-1600

Among the major research facilities in the department and in the Institute mention may be made of a well equipped low temperature laboratory with liquid helium facility, X-ray generators and cameras, X-ray diffractometer, optical microscopy and interferometry EPS and NMR spectrometers, infrared and optical spectroscopy laboratory, lasers, nuclear physics laboratory, a 2 MeV van de Graaff machine and the computer centre with IBM 1620, IBM 1401 and IBM 7044 computers.

The posts are permanent and carry retirement benefits in the shape of CPF-cum-gratuity Scheme or GPF-cum-Pension-cum-Gratuity Scheme.

Other things being equal, preference will be given to SC/ST candidates.

The age of retirement is 60 years. Besides pay, posts carry allowances according to the Institute rules, which at present correspond to those admissible to Central Government employees

stationed at Kanpur. Higher initial pay is admissible to specially qualified and deserving candidates. Candidates called for interview will be paid second class railway fare from the place of duty to Kanpur and back by the shortest route.

Applications from persons in India should be made on the prescribed forms obtainable free of charge from the Registrar of the Institute by sending a self-addressed unstamped envelope of 25 cm x 10 cm, size. Applications should be accompanied by a postal order for Rs. 7.50 (Rs. 1.87 for SC/ST candidates).

Persons abroad may apply on plain paper (two copies) including an account of their academic and professional records and reprints of publications, fields of specialisation etc. They should also give names of at least three persons who are intimately acquainted with their academic activities.

All applications should reach the Registrar, Indian Institute of Technology, Kanpur, IIT Post Office, Kanpur-208016 by 30th September, 1974.

INDIAN INSTITUTE OF TECHNOLOGY KANPUR IIT POST OFFICE KANPUR-208016

Advertisement No. 22/74

IIT Kanpur is one of the five Institutes of national importance set up by the Government of India in 1960. It has about 1200 undergraduates and 800 post-graduates on its rolls. Undergraduate Programme offers training in six different fields of engineering and Post-graduate programme prepares for a higher degree in these engineering subjects as also research programme leading to Ph.D. degree in engineering, sciences and humanities. It has a faculty of about 300, chosen from all over India and abroad.

IIT-K is located on G.T. Road, ten Km. West of Kanpur, on a self developed Campus having its own arrangements for maintenance of roads, electric and water supply. About two thousand students and 5000 persons belonging to the families of the faculty and other staff are resident on Campus. Community facilities include primary and secondary schools, a Health Centre, an internal telephone system, and shopping centre with a bank, post office, restaurant, consumers' co-operative and other shops.

The Institute is looking for persons of eminence, special qualifications and experience, to manage three areas or responsibilities : (i) Academic administration, (ii) Civic affairs including Community facilities and (iii) Staff Welfare. Applications are, therefore, invited for the following :—

I. ADMINISTRATIVE OFFICER—1 post

Job description

Overall responsibility of the office work related to the academic adminis-

tration of the Institute, including recruitment, promotion and discipline of staff in academic departments/sections.

Qualifications and Experience

1. *Essential*—(i) a University degree, (ii) minimum 10 years of experience in a responsible supervisory administrative position in Government educational or research Institutes/Commercial houses of national standing.

2. *Desirable*—Postgraduate degree in Business/Management.

Pay Scale—Rs. 1600-100-1900

Upper age limit—40 years.

II. CIVIC ADMINISTRATOR—1 post
Job description

Overall responsibility of city administration and activities including maintenance of buildings, road and parks; water supply and electricity; Estate office; transport; Watch and Ward; Health Services; Schools; and Shopping Centre. Recruitment, promotion and discipline of the staff in the city administration.

Qualifications and Experience

1. *Essential*—(i) a University degree, (ii) minimum 10 years of experience in a responsible supervisory administrative position in Government/City/large commercial estate/housing colony.

2. *Desirable*—(i) Degree/Diploma in Personnel Management.

Scale of Pay—Rs. 1600-100-1900

Upper Age limit—40 years.

III. STAFF WELFARE OFFICER—1 post

Job description

Assisting Institute administration in looking after the welfare of the staff. Assistance in redressal of grievances, organization of recreation activities of the staff and management of staff related facilities. The work will include looking after statutory obligations relating to labour enactments.

Qualifications and Experience

1. *Essential*—a University degree with post-graduate degree/diploma in social science/social welfare.

Minimum 5 years experience as a Welfare/Labour officer.

2. *Desirable* (i) a degree in Law (ii) specialization in industrial relations and labour management.

Scale of pay—Rs. 700-40-1100-50/2-1250
Upper age limit—35 years.

The scales of pay given above are subject to revision as per Third Central Pay Commission recommendations as approved by Government. Besides pay, post carries allowances according to Institute rules which at present corres-

pond to those admissible to Central Government employees stationed at Kanpur. Higher initial pay is admissible to highly qualified and deserving persons. The Selection Committee may relax any of the above requirements for the posts in exceptional cases.

Appointment will be on contract basis initially for a period of 5 years. Deputation on foreign service terms will also be acceptable. Incumbent will be entitled to other benefits such as housing, medical care etc. as admissible to other regular employees of the Institute. They will also be permitted to join the Institute's Contributory Provident Fund.

Other things being equal, preference will be given to Scheduled Caste/Scheduled Tribes candidates.

Applications should be made on prescribed forms obtainable free of charge from the Registrar of the Institute by sending a self addressed unstamped envelope of 25 cm. x 10 cm. size. Names of three persons who are fully acquainted with the professional experience and character and nature of the applicant may be given so that a reference could be made. Applications accompanied by a postal order for Rs 7.50 (Rs 1.87 for SC/ST candidates) should reach Registrar, Indian Institute of Technology, Kanpur, IIT-Post Office, Kanpur-208016 not later than 30-9-74.

SOUTH GUJARAT UNIVERSITY SURAT

Applications are invited for the post of Reader in Statistics in the Department of Mathematics and Statistics of this University in the Pay Scale of Rs. 700-50-1250 with usual allowances.

The minimum qualifications for the post are as under:

At least Second Class Master's Degree or a Ph.D. Degree in the subject AND Three years experience of teaching-Postgraduate Classes and some independent published research work or some published work of merit.

The candidate with knowledge of Gujarati will be preferred. Person without such knowledge if appointed will be required to acquire working knowledge of Gujarati within the period of probation which shall be of two year.

Eight copies of the application should be submitted in prescribed form which can be had from the undersigned on payment of Re. 1/- in cash or by Postal Order and with self addressed envelope of 23 cm. 13 cm. size duly stamped with Re. 0.40 ps. The last date for receipt of applications is 30-9-1974.

G.A. Desai
REGISTRAR

Surat

Date: 30-8-1974

FACULTY OF COMMERCE AND BUSINESS MANAGEMENT BANARAS HINDU UNIVERSITY ADMISSION NOTICE

Session—1974-75

1. Master of Business Management (2-Year: Four Semester) Eligibility: A graduate of any discipline. Those

appearing in the qualifying examination in 1974 may also apply.

Criteria: Based on applicant's academic and other record, his performance at the Written Test, Group discussion and personal interview. The Written Test will be held on October 20, 1974 at Delhi, Patna, Bhopal, Hyderabad, Kanpur and Varanasi. Those who qualify in this test will be called for Group Discussion and Personal Interview at a later date.

2. Master of Business Management (3-Year: Six Semester Course).

Eligibility:

(1) Graduate in any discipline of a recognised University.

(2) At least two years' experience in a supervisory capacity in a business or industrial house, bank, government undertaking or other public agency or that of running one's own business, or as a teacher in a Faculty or College of the Banaras Hindu University.

(3) Age: not below 21 years on 1-10-1974.

Admission Criteria:

Applicant's academic and other records, his experience and his performance at the Personal Interview.

3. Master of Commerce (Two Year Course).

Eligibility:

B. Com. of a recognised University.

4. Bachelor of Commerce (3-year Degree Course).

Eligibility:

Part First: P.U.C. (Arts/Science/Commerce)/Intermediate Arts/Science/Higher Secondary/Senior Cambridge.

Part Second: Intermediate in Commerce.

Admission to M. Com./B. Com. is purely in merit.

Last Date

Last date for receipt of Admission Forms in the Faculty Office for:

1. M.B.M. (2 Years) course—5-10-1974.

(Forms from those opting for Varanasi Centre and delivered in person at the Faculty Office will be accepted without late fee upto 12th October, 1974 and with a late fee of Rs. 10/- (Ten) upto 19th October, '74.

2. M.B.M. (3 Years) course—5-10-1974.

3. M.Com.—15-12-74.

4. B.Com.—10-10-74.

5. For Application Form:

Write to the Dean, Faculty of Commerce and Business Management, Banaras Hindu University, Varanasi 221005 enclosing an I.P.O. for Rs. 2/- (payable to the BANARAS HINDU UNIVERSITY) and a self-addressed envelope (size 28 cm x 13 cm), OR obtain it in person between 11.00 A.M. and 1.00 P.M. on cash payment.

NOTE

Admission form for M. Com. will be available only after 19th November, 1974

Classes of B. Com. Part I and II will start from 19th November 1974.

Classes of M. Com. Part I will commence from 2nd January 1975.

THE UNIVERSITY OF KASHMIR SRINAGAR NOTICE

APPLICATIONS to reach the undersigned by September 14, 1974 are invited for the following posts:—

Post	Grade (Unrevised)
1. Reader in Law:	Rs. 700-50-1250
2. Lecturers in Education, English and Law.	Rs. 400-40-800- EB-50-950

For details and prescribed application forms please apply sending crossed postal order for Rs. 6/- (Rupees six only), cashable at the Srinagar Post Office, in favour of the Registrar, University of Kashmir, Srinagar.

(M. A. Chishti)

REGISTRAR

No. F. 10 (ADV-POSTS) Adm
The University Campus,
Hazratbal, Srinagar-6
August 9, 1974.

CENTRAL INSTITUTE OF ENGLISH & FOREIGN LANGUAGES HYDERABAD 500007 Advertisement No. X/74

Applications on the prescribed form together with necessary application fee, are invited for the following posts, in the Institute service so as to reach the undersigned on or before 27-9-1974.

PROFESSOR: Rs. 1100-50-1300-60-1600

1. Professor at the Regional Centre, Shillong

Qualifications:

Essential

- First or High Second Class Master's Degree in English.
- A research degree of doctorate standard or published work of equivalent standard.
- At least five years' experience of Post-Graduate teaching and research guidance.

Desirable

Specialised training in the teaching of English and experience of organising English Language Teaching Programmes.

READERS: Rs 700-50-1250

- Reader in the Department of Literature.
- Reader in the Correspondence Course Unit.
- Reader at the Regional Centre, Shillong.
- Reader in Curriculum Construction.
- Reader in Methods.
- Reader in the Department of German.

Qualification

Essential

For Posts No. 1, 2, 3

- (i) First or High Second Class Master's Degree in English.
- (ii) Research degree or evidence of research.
- (iii) Specialised training in the teaching of English.
- (iv) At least five years' experience of teaching at the college level or in a Teacher Training Institution.

For Posts No. 4 & 5

- (i) First or High Second Class Master's degree in English. Education or Psychology with high level competence in English.
- (ii) Research degree or evidence of research in one of the above fields.
- (iii) Special interest in Psycho-linguistics or socio-linguistics/Curriculum Construction/Education Technology/Programmed Instruction/Computer Programming.
- (iv) At least five years' experience of teaching at the college level or in a Teacher Training Institution.

For Post No. 6

- (i) At least a Second Class Master's degree in German or an equivalent qualification with a good command over English.
- (ii) Research Degree in German or evidence of Research.
- (iii) At least five years experience of teaching German at a college level.

Desirable

For Post No. 1: Special interest in Modern English Literature including Indian English Writing/Stylistic and Literary interpretation.

For Post No. 2: Experience of teaching English through Mass Media or Correspondence Course.

For Post No. 3: Experience of organising English language Teaching Programme and producing materials.

For Post No. 4 & 5: (i) Specialised training in the teaching of English.

(ii) Experience of producing and evaluating teaching materials.

For Post No. 6: Experience of producing materials for the teaching of German and/or translation and interpretation.

LECTURERS : Rs 400-40-800-50-950

1. Lecturer in the Department of Extension Services
2. Lecturers in the Department of Linguistics & Contemporary English
3. Lecturer in the Department of Phonetics & Spoken English
4. Lecturer in Methods

5. Lecturer in English Literature

6. Lecturer in the Department of Materials Production

7. Lecturer in German

8. Lecturer in Russian

9. Lecturers at the Regional Centre, Shillong

Qualifications

Essential

For posts 1, 2, 3, 4, 5 & 9

(i) A First or High Second Class Master's Degree in English.

(ii) A Post-graduate Degree or Diploma in English Language Teaching or English Studies or Linguistics or Phonetics or Applied Linguistics or at least two years experience of teaching the subject at a college or Teacher Training Institution.

For Post No. 6

(i) First or High Second Class Master's Degree in English.

(ii) Specialised training in the teaching of English or at least two years' experience of teaching English/producing materials in a recognized institution.

For Posts 7 & 8

(i) First or High Second Class Master's Degree in German/Russian or an equivalent qualification with a good command over English.

(ii) At least two years' experience of teaching the subject in a recognised institution.

Desirable

For all posts: A research degree or evidence of research in the field concerned.

For post no. 2: Special interest in the field of Grammar

For post no. 5: Special interest in Stylistics and Literary interpretation

For post no. 6: Experience of producing teaching materials in English

For post nos. 7 & 8: Experience of producing materials for teaching German/Russian

PROGRAMMER : Rs 700-50-1250

Qualifications

Essential :

(i) First or High Second Class Master's degree in English or Education or Psychology with high level competence in English.

(ii) A degree in 'Programmed Learning' or practical experience in the preparation of programmed materials for language teaching.

(iii) At least five years experience of teaching at the school or college level.

(iv) High level proficiency in Hindi or Tamil.

Desirable :

Evidence of Research in the field of English Language Teaching.

LIBRARIAN : Rs 650-30-740-35-810-25-180-40-1000-EB-40-1200

Qualifications :

(i) At least a Second Class Master's

Degree in English with a degree/diploma in Library Science; OR At least a Second Class Bachelor's degree with a Master's Degree in Library Science.

(ii) Five Years experience in Library Management in a University/Institution of higher learning/a public library

Note :

1. Allowances at Central Government rates with the benefit of Contributory Provident Fund-cum-Gratuity from the date of their being placed on probation. Revised UGC scales of pay for teaching staff are under consideration.
2. A higher start in the grade may be considered for specially qualified candidates.
3. Qualifications are relaxable in case of candidates with exceptional qualifications.

AGE :

For Professors : Not below 35 years

For Readers & Programmer : Not below 30 years

For Librarian : Not above 45 years.

GENERAL NOTE :

1. Separate application should be made for each post.
2. Posts No. 1 and 5 of Readers and one of the posts of Lecturers at Serial No. 2 and the Librarian are permanent. The rest are temporary but likely to continue.
3. Age of retirement for all posts except Librarian : 60 years; for Librarian : 58 years.
4. Candidates must enclose seven copies of lists of papers published, if any, indicating the journals and dates along with one copy of each of their publications.
5. In case the Selection Committee finds that the candidates interviewed by them are not up to the mark, the Committee may consider them for a lower cadre post or a lower scale of pay.
6. The selected candidates should be prepared to work in Hyderabad or at any of the centres of the Institute.
7. A candidate called for interview from a place outside Hyderabad will be paid a contribution towards his/her travelling expenses at the rate of single second class railway fare, including sleeper coach charges from the place of his/her work or the place of his/her residence, whichever is less, by the shortest route.
8. Application forms can be had from the Registrar, Central Institute of English and Foreign Languages, Hyderabad 500007 (AP) India, on payment of Rs 2.00 in person or by Postal Order payable to the Director, Central Institute of English and Foreign Languages, and by sending a self-addressed envelope (10 cm x 23 cm) stamped for ordinary (55 np) or Registered post (Rs 1-80).

(L. B. Deshpande)
REGISTRAR



And his future was bright once again.

A year ago, there was a day that threatened to be his darkest. His retina needed immediate surgery, it needed a laser beam. And it was not available in India. A bright future hung by a slender thread.

We were contacted. The call went around 5 continents and the hunt began. Seconds ticked by, as Air-India staff combed hospitals around the world. The tension ended when the equipment was finally found in Mannheim. We flew the child to Frankfurt, another airline pooled in its effort and flew him on to Mannheim.

Today, when he chases a butterfly, picks a bunch of flowers, loves things bright and beautiful, we feel proud of our job. The job of carrying people from one place to another. Sometimes, even from darkness to light.

We have a wide network of communication facilities to help you in any situation. We have 129 offices and 34 destinations the world over. So you have friends in almost every part of the world. Friends who go out of their way if you should need something out of the way. Try us and we'll make you an Air-Indian. For ever and ever.



Univest

CHRONICLE OF HIGHER EDUCATION & RESEARCH



October 1974

Re. 1.25

Workshop on Autonomous Colleges

Nature & Purpose of Librarianship

The Educated Youth

The VII Asian Games

THE ASSOCIATION OF COMMONWEALTH UNIVERSITIES

Commonwealth Universities Yearbook 1974

The fifty-first edition of the 'Commonwealth Universities Yearbook' will be available in October.

The yearbook is a directory to Commonwealth universities of good standing. It is revised annually and is marked by the care taken in its compilation and the simplicity of its format. The university chapters include :

- a complete listing of teaching staff, principal officers and administrative staff
- affiliated, associated and constituent institutions
- history, location, constitution and income of the university
- libraries, laboratories, museums, teaching hospitals and research institutes
- outlines of first and higher degrees
- fees
- academic year
- residences and student services
- publications
- highlights of the previous year
- statistics of enrolment and degrees awarded.

The 1974 edition includes chapters for four new institutions in India, Malaysia and Papua New Guinea.

For each of Australia, Bangladesh, Britain, Canada, India, Malaysia, New Zealand and Nigeria, there is a general article, contributed by an outstanding academic, which describes the system of higher education in the country. Most of these articles include a bibliography of current material and a directory to the subjects of study available at the universities of the country; the level at which these programmes are offered is indicated.

A major appendix is devoted to the entry requirements of the universities of these countries. It describes admission in terms of the local certificates required, the certificates accepted as equivalent and the specific requirements of each programme. The appendix offers information for students from abroad and states the last date for receipt of applications. Another important appendix offers information concerning out-of-country student enrolments in the universities of Australia, Britain, Canada, India, New Zealand and Nigeria.

The Yearbook also offers an index of 125,000 names to assist the reader in locating teaching and administrative staff anywhere in the Commonwealth.

This 2,400-page guide is published by the Association of Commonwealth Universities (London, England) and is available in India from UBS Publishers' Distributors Pvt Ltd, 5 Daryaganj, Ansari Road, Delhi-110006.

UNIVERSITY NEWS

Vol. XII
No. 10



OCTOBER
1974

A Monthly Chronicle of Higher Education

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Opinions expressed in the articles and reviews are individual and do not necessarily reflect the policies of the Association.

Continuing Education

Prof. J. N. Kapur

TODAY there is a virtual knowledge explosion in the world due to which our knowledge in any field doubles in a period of 8-10 years. Today we have about 100 times as much knowledge as we had in the beginning of the century and by the end of this century this knowledge will again increase by ten times. No individual can acquire all the knowledge needed in his life during his school or college days simply because 50 times as much knowledge may be created after his leaving college. As such life-long learning, learning how to learn, learning to be and continuing education have become vital necessities for the modern citizen.

Our goal has to be a learning society where every one continues to spend 10-15% of his time throughout his life in education and self-learning. It is imperative for the society to provide facilities for continuing education for every member of the society. We in India are of course far away from the goal since 70% of our people do not know even to read and write. However even the literacy programmes become a part of continuing education because those who could not enter school at the age of 6 or 10 should be given access to education at a later stage in life.

Continuing education can be provided through:

(a) Full-year courses for doctors, lawyers, engineers, teachers, professional scientists at intervals of about 5 years.

(b) Summer courses of six to eight weeks duration.

(c) Part-time year-long evening courses which may meet once, twice or thrice a week in the buildings of schools and colleges which are free at that time.

(d) Correspondence courses together with some limited contact programmes.

organised under the auspices of the universities.

(f) Professional conferences, study group meetings T-groups and counter groups etc.

The courses in continuing education may be professional courses for updating the knowledge of professionals in their fields. These can be courses in human relations, leadership and management, or general purpose courses in humanities, or social, physical and biological sciences. There can be courses for farmers of increasing productivity in agriculture or for enriching the cultural life of the community. Housewives can have courses in cooking, dressmaking, interior decoration, home economics etc. There can be courses in modern Indian and foreign languages, law for every one, population problem, problems of space age, computer programming, teachings of various religions, problems of Indian defence, the story of civilization, introduction to art, sculpture and architecture, astronomy, literature etc. In fact for both variety and depth, only sky is the limit for continuing education.

Our constitution gives a directive that all efforts should be made to provide free and compulsory education to children in the age-group 6-14. No mention was made of education of the adults of the country who have to make a success of the democratic experiment. At least 20% of the national resources for education should be spent on continuing education.

We must have extension wings for continuing education in all universities on the same lines as we have extension wings for agriculture in the agricultural universities. Our goal should be a learning society where every one learns continuously from the womb to the tomb.

Workshop on Autonomous Colleges

A WORKSHOP on Autonomous Colleges was held at Gujarat University, Ahmedabad from the 3rd to 5th August, 1974 which was attended by 44 participants including 6 Vice-Chancellors, and 4 students from Madhya Pradesh, Rajasthan, Gujarat and Maharashtra. The main recommendations of the Workshop were:—

DEVELOPMENT OF POSTGRADUATE EDUCATION:

1. Facilities in all postgraduate colleges and university departments should conform to the norms for postgraduate courses to be prescribed by the U.G.C. Fresh affiliation for postgraduate courses may be only given when the institutions provide the prescribed facilities. The affiliation, however, should not be permanent, and it should be subject to periodical review. The U.G.C. should not provide assistance for fulfilling the conditions of affiliation; however, it may recommend to the University/College/State Government to take necessary measures for the improvement of the conditions of the college failing which the university might consider withdrawing the affiliation. The U.G.C. and the respective university should send joint committees to colleges to see whether the norms for postgraduate courses are adhered to by the colleges.
2. Postgraduate education can not be treated as a right for every graduate. Admission should be on selective basis to those who have a proven capacity and aptitude to benefit from it. Therefore a certain grade (or percentage of marks) may be fixed as the minimum qualification for admission to a postgraduate course. These students along with others may join non-formal courses through correspondence or non-conventional applied courses of short duration (certificate/diploma courses).
3. A cluster of colleges may provide co-operative teaching by pooling their facilities. While lecture room facilities, books and common laboratory equipment may be provided at each college, facilities for costly books, journals and equipment may be made available at a postgraduate centre which should be set up by the university with a core staff of its own. The postgraduate centre may have a number of floating positions to which well qualified teachers from the colleges may be seconded for limited periods. There should be a postgraduate centre for every 3 postgraduate colleges or at least one in every district.
4. There should be an assessment of the manpower needs of postgraduates in science, arts, commerce subjects etc. Once the national needs are identified and quality of undergraduate education improved, many postgraduate affiliated colleges may become superfluous.
5. Postgraduate courses may not be uniform in all institutions, even in conventional subjects. The universities may run a different type of postgraduate course like the Honours School Course of the Panjab University, different from that run by the postgraduate colleges. The universities may also provide for interdisciplinary courses.
6. Functional courses relevant to the immediate needs of the community may be introduced at postgraduate level. The duration of such

courses may vary according to the needs of the courses, and these may lead to the award of a degree/diploma/certificate. The Universities/Colleges may keep in constant touch with industry/agriculture and provide courses or project works to meet regional and national needs. Courses suitable for self-employment may also be offered.

7. Project work or dissertation should be an integral part of the postgraduate courses and should not be in lieu of papers.
8. The staff teaching at postgraduate level must have research qualification. They should also be engaged in current research. The UGC should provide facilities to strengthen research activities in colleges as well as for the improvement of the qualifications of the teachers. There should be a Research Coordination Committee of the University, subjectwise, to assess, evaluate and review the progress of work in the postgraduate departments of colleges.

AUTONOMOUS COLLEGES

1. A college can become autonomous if the university confers autonomy on the college but UGC's concurrence and financial assistance of a marginal nature may be made available on the basis of an assessment of the programmes of the college by an Expert Committee of the UGC. The existing financial problems of the colleges should not be linked with UGC assistance to selected autonomous colleges, but the UGC may use its good-will with the State Governments to liberalise the grant-in-aid codes.
2. There need not be any rigid limit as to the size of an autonomous college but it should essentially be a quality institution large enough to be viable with a critical staff strength having a staff student ratio of 1:15 for undergraduate departments and 1:10 for postgraduate departments. However, the most important criterion in the selection of an autonomous college should be its dedication, involvement, commitment and discipline.
3. Creation of new autonomous colleges may not be worthwhile but priority should be given to conferment of autonomy on outstanding existing institutions. To start with postgraduate departments of colleges/professional colleges/university departments may be selected.
4. Reservation of seats for scheduled castes/scheduled tribes and other backward sections may be made on the pattern prevalent in each State but special attention should be bestowed in raising their standards through remedial courses.

5. In regard to exercise of academic autonomy the college should make the fullest use of talents and expertise available in the area; if necessary visiting experts may be invited from outside. Additional financial inputs are necessary for (a) staff training; (b) part-time specialised staff; and (c) improvement of physical facilities such as library, laboratory, workshop.
6. The State Government and the management should augment the resources of the college, apart from the likely assistance from U.G.C.
7. Government Colleges should have properly constituted governing body consisting of the Director of Collegiate Education, the Principal and a senior Professor of the College and a university representative. The faculty should not be transferred from the college unless specifically requested by the concerned staff member and/or is recommended by the governing body.
8. Student participation in the academic council and board of studies department-wise should be ensured through university statutes.
9. Co-operative teaching between autonomous colleges and the other colleges as well as co-operation among the autonomous colleges is considered useful and necessary.
10. The process of assessment of students should be continuous and the students in turn may also anonymously conduct evaluation of the teachers with a view to assessing the efficiency of teachers in the teaching-testing-learning processes.

EXAMINATION REFORMS

(a) *Internal Assessment:*

1. The introduction of internal assessment in contrast to the present point-in-time examinations is an important step towards the integration of teaching, learning and examinations. This is likely to stimulate academic competition, lead to improvements in the techniques of teaching and evaluation of curriculum and promote the habits of study and learning. With the introduction of continuous sessional work, evaluation will become formative and not merely summative and examinations will not only perform the function of labelling the products through classification and grading but will also have a "backwash" effect.

2. Experiments in internal assessment being conducted by different universities in the Western region e.g. Bombay, Gujarat Vidyapeeth and Gujarat University were described in detail and noted with interest.

3. The following safeguards were suggested to ensure that the system of internal assessment is not abused:

- (i) Internal assessment may be tried out, at least to begin with, first in the unitary universities,

well-established postgraduate departments and autonomous colleges before it is extended to the affiliating universities or to the undergraduate stage of education.

- (ii) It should be clearly understood that internal assessment is not meant to enforce discipline. Its purpose is entirely academic, to encourage students to apply themselves assiduously to their studies and to enable teachers to realise the effectiveness of the teaching-learning process.
- (iii) It is necessary that the marks or grades obtained by the students are made known to them immediately after evaluation is completed.
- (iv) Candidates who wish to represent against the grade awarded to them should be given an opportunity to do so and the matter considered by a scrutiny committee. Revaluation may be done, if necessary.
- (v) Another important feature that should be built into the scheme is that of correcting the answer scripts and discussing these in some detail in the tutorials or individually so that internal tests serve as a feed-back.
- (vi) The marks of internal and external examinations should be kept separate for they measure different abilities and combining the two is scientifically unsound. The marks in *practicals science* should also be shown separately on the certificate or degree awarded to the student.
- (vii) The records of internal assessment should be maintained so that a proper scrutiny or statistical analysis can be carried out.
- (viii) Teachers should not be allowed to take up private tuitions; otherwise the scheme of *internal assessment* will not work in view of vested interests.
- (ix) The introduction of internal assessment will, irrespective of the methods employed, increase the work-load of teachers. Teachers have, therefore, to be prepared to shoulder this responsibility.

It was noted that some affiliating universities have also introduced the internal assessment system. This is welcome but the universities concerned should ensure that the marks in internal assessment and external examinations are not combined and should also consider suitable scaling procedures, if necessary.

(b) Question Banks

It was noted that the University of Poona has developed a question bank for second year B.Sc. examination in Physics under the University Leadership Project. A similar bank of questions in Chemistry is under way.

Doubts were expressed regarding the following points in regard to the development of question banks:

- (i) Certain subjects like languages, mathematics, statistics and engineering (especially these

subjects where numerical question may have to be set) may not be entirely suitable for the development of a question bank. In such cases, the question bank may cover only a portion of the syllabus or the questions may be purely illustrative.

- (ii) One of the abilities required of a student is that he should be prepared to meet unforeseen situations. If all the questions are known to the students, there will be no element of surprise and consequently the ability to adjust to new situations may not be tested. For this reason, some questions from outside the bank may be included in the question paper. This also underscores the value of having problem-oriented questions, which are not stereotyped.
- (iii) The question bank may lead to the publication of guides and notes which may create problems of security as the material can be smuggled into the examination hall and can lead to copying or use of unfair means.

It was agreed that the experiment of question banks being tried out in a few universities should be studied and introduced in a phased manner. It was agreed that question banks can be useful for a closer linkage between the learning process and examinations. It was also agreed that the U.G.C. should disseminate information relating to various measures of examination reform including the grade system and innovations introduced by the universities. The final guide-lines to be drawn up by the U.G.C. at the conclusion of the series of workshops may be discussed by the U.G.C. with a cross section of the student representatives.

PERSONAL

1. Dr. C. Krishna Rao has been appointed Vice-Chancellor of Andhra Pradesh Agricultural University w.e.f. 1-9-74.

2. Shri Karunapati Tripathi has been appointed Vice-Chancellor of Varanaseya Sanskrit Vishwavidyalaya w.e.f. 2-9-74.

3. Dr. D.K. Choudhuri has been appointed Vice-Chancellor of Kalyani University w.e.f. 6-9-74.

4. Prof. A.M. Khusrro has been appointed Vice-Chancellor of Aligarh Muslim University w.e.f. 20-9-74.

5. Shri A.K. Banerji has been appointed Registrar of Burdwan University w.e.f. 1-9-74.

6. Shri L.N. Tiwari has been appointed Registrar of Varanaseya Sanskrit Vishwavidyalaya w.e.f. 4-9-74.

Nature & Purpose of librarianship

KHOGESWAR BORA

THE library of today is a social agency—an agency of communication and an agency for education. It is different from the collection of books represented in a bookstore. It differs from and greater than, such channels as radio, television, or film in the dissemination of ideas. It is different from but certainly as important as the school and the college as an educational institution. No other agency achieves quite so well the informal kind of self-education that a democratic people need in to-day's world. No other agency provides the same variety of entertainment, education and information, based on the needs and interest of the user. No other agency provides, under a single roof for the preservation of the heritage of the past, a flexible reflection of the major currents of the present and planned preparation for the needs and interests of the future.

As the library has many functions for the betterment of the society, today's librarian is not one person, but many persons. The changing library has in many ways made librarianship a much more challenging, demanding and dynamic profession.

According to J. Periam Danton "Librarianship is that branch of learning which has to do with the recognition, collection, organisation, preservation and utilization of Graphic and Printed Records". Librarianship refers to a profession, or to a body of knowledge which can be studied or to the application of this knowledge to practical activity.

Thus we have seen that the word librarianship has several meanings and definition but the available definitions of librarianship all include four main areas of activity. They indicate that librarians are primarily responsible for :

1. The selection and collection of material appropriate for libraries.
2. The preservation of material.
3. The organization of the collections.
4. The dissemination of the material or the information which it contains. This may include interpretation.

Preservation and organization are often treated as one, so that the function has been expressed simply as acquisition, management and use of appropriate material. Some libraries carry out the first three functions only, and in unfavourable cir-

cumstances the first two may be all that is possible, but most fully developed modern library services include all four functions.

To do these functions for a life time and to do them successfully the librarian must have life long conviction that libraries are good for the people and that he is good for libraries. Over and beyond the required qualifications of the librarian a very special attitude is essential. The aim of librarianship is to provide a service to people through books and other materials which are the elementary and necessary agents of human civilization. The selection, description, interpretation, evaluation and organisation of books in a library are undertaken in order that the books may be effectively used and that the readers may have access to the knowledge they contain. In librarianship the challenge is threefold. First, there is the response to types of material, second, there is the response to needs of groups of readers, third, there is the response to areas of subject knowledge and their differences in breadth and depth. It is the modern developments in these three areas which have resulted in the growth of different types of librarianship like, national librarianship, university librarianship, public librarianship, special librarianship etc.

Is librarianship a science?

This is pseudo problem and the short answer is that librarianship is both a science and an art. In each of the four functions mentioned above for which librarians are responsible, scientific techniques are required. The theoretical foundations, moreover, are largely sociological. But many of the typical professional activities, like book provision, remain an art in the traditional sense. Even management can be regarded both as an arts and a science. Librarianship is commonly regarded as social service-service to people and through them to society the methods of social services are applied to the field of librarianship. So it may be popularly called social science.

Purpose of Librarianship :

THE PRESERVATION OF MATERIAL :

In modern well-equipped developed library system the first law of library science that 'BOOKS ARE FOR USE' is strictly followed. Closer examination reveals that books are not for preservation but for effective use by the readers. But if we

think for our next generation and for future readers preservation of certain reading materials is quite essential. This is why some national libraries, such as the British Museum are required to preserve, everything except items like books with blank pages, whose non-communication value is total.

In this context we inevitably think of national and academic libraries first, but it is clear that all libraries are likely to have some material which should be rescued from its current enemies or friends.

The role of librarian considered as custodian is simple. He is by no means 'the little friend of all the world', and must devote all his energies to overcoming the enemies of books. Historical and natural calamities are beyond his control, but he can be vigilant against the minor destructive forces which are chemical, human, animal, insectival atmospheric, fungoid, etc.

RESEARCH:

National and university libraries provide material for research as their main purpose. Material is preserved in repository libraries like the Centre for Research Libraries in the United States for research workers of the future. The pattern of research and the needs of research workers are changing in a manner which is a constant challenge to all research libraries. The methods of research also vary according to the subject field. It is clear that any library which possesses any kind of research materials and provides material for the search worker must adopt documentation.

The librarian must be concerned mainly or solely with bibliographical work such as abstracting or indexing or, particularly, literature searching to assist the research workers.

THE INFORMATION ROLE :

The process of dissemination of information should be regarded as an essential part of librarianship, otherwise librarians may be reduced to their primitive condition of custodian. Reference service implies that a fully organised well equipped modern library system of any kind is capable of playing an active information role, at least to some degree, or in certain subject areas. The communication agencies, including television, the radio and the press, provide information but in the first instance they must obtain many types of prior information from suitably organised library service.

On the contrary many public relation officers in government departments or in large industrial firms or in public services, depend for their efficiency on good library activities.

The most modern emphasis on the importance of dissemination of information has transformed librarianship as a practical activity and as a theoretical discipline. This is the cause of the growth of the special library movement, particularly in the scientific and technical field. This has led to the creation of 'documentation' services, which involve specialist subject knowledge and the interpretation of literature by information officer.

EDUCATION :

Libraries are the collections of books and other reading materials. It is clear that any book may have an educational value for a particular person, irrespective of its subject or its intellectual level. All sorts of libraries public or academic, special or technical are the agencies of education. The role of public library in education can only be appreciated in relation to the education system as a whole. The primary purpose of the present Education system of India is to give opportunity to each and every citizen to develop his ability, his individual judgment, his sense of moral and social responsibility and to become a useful member of society who will safeguard, strengthen and improve the democratic and representative Government. But this sort of government depends for its ultimate success upon the education of all the people and upon the widest diffusion of knowledge among the masses. This is possible only through an intelligent and effective public library service which may be regarded as an essential instrument for putting progressive and dynamic method of teaching into practice. It is appropriate that UNESCO in its library programmes for underdeveloped countries should regard the public library as only one agency among others for the promotion of mass education and for the elimination of illiteracy.

Academic libraries are regarded as the heart of the academic institution and powerful instrument of education, recreation, information and entertainment for the readers both teachers and students. The fulfilment of progressive and dynamic method of education and curriculum requires a well-organised, well staffed and well-conducted library service.

We should take note of the large number of institutions whose aim is to promulgate particular opinions, or enlighten the public on specific issues. This is the realm of propaganda, and libraries are an essential part of it.

THE CULTURAL ROLE :

Cultural role of public libraries is quite akin to educational role. For example, the public reference department, particularly in small libraries could emphasise its information role as a cultural centre for the provision of every kind of practical information.

The cultural purpose of university, college and school libraries is education beyond curriculum. This is the peculiar responsibility of the librarian in his book selection activities. He is concerned with the 'gaps' between the subjects studied, and with the relations between them. True cultural role of the special library is inevitably to be found in carrying out the purposes of the parent organisation.

Taking into account the present trends as also the future possibilities due to impact of new knowledge, new discoveries and inventions and considering the future social and cultural set-up of society it may be concluded that the profession calls for sound general education and culture adequate technical training and knowledge of the theory and practice of librarianship.

It would be wrong to accuse the modern youth of indiscipline. A superficial observation will reveal that there is actually no sphere of life or community of persons where agitational methods have not been resorted to.

The Educated Youth

DR. B. C. DAS

UNREST in University campuses has become a familiar phenomenon all over the world today. Alongwith it there is either strike, demonstration or agitation practically by everyone we came across in the country. In view of that it would be wrong to accuse the modern youth of indiscipline. A superficial observation will reveal that there is actually no sphere of life or community of persons where agitational methods have not been resorted to in order to get even their genuine demands fulfilled. Demand is necessary. But the method is bound to be modelled on the mode of responsiveness of the authorities. When we look at the teachers, employees, politicians, lawyers, judges, even policemen and armed constabulary we find everyone at strike at sometime or other. If that be so who will bell the cat? Or, who will guard the guardians? Agitational methods have proved to be useful and necessary. It may be interpreted otherwise that there is presence of unrest in every department of life. But since the youngmen are at the for-

mative stage, the elders refuse to approve of their course of action and come forward even with an exaggerated speed to condemn their action with a hope for their reform in order to uphold the existing order of things.

Prior to independence, the youngmen of this country contributed their mite to bring about the birth of freedom. Gandhiji, the father of the nation, taught us the methods of Satyagraha, Civil Disobedience and non-violent non-co-operation. After independence, there was practically unanimous appeal from all the political leaders to the youth that peaceful, constructive and non-violent methods are to be adopted for getting their grievances redressed. The change in emphasis was needed in view of the changed circumstances. But the problems of the youth had not received appropriate attention in the hands of alien administration. The system of education, as introduced by the British, was intended to produce clerks. It did not provide necessary incentive to the Indian youth for any other creative activity. It was for a long time that nothing concrete was done

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in independent India to tackle the problems of the youth. Negligence led to indifference, unrest, upsurge and indiscipline.

The youth upsurge has become the go of the day. Apprehensions by the authorities have led to precautions by stationing armed police, and constant discussions, and consultations at the official level. The talk of some of the political leaders and the shape of developments made the authorities extremely panicky and the steps they took accentuated the problems. The youth upsurge is just a symptom of the disease, not the whole. The demonstrations and agitations have proved the hollowness of the administrative machinery. This is something peculiar, if not unusual.

All over the world, youth is the major rising force which challenges the existing order upheld by the elders. In case of India, they have more reasons to be disturbed and discontented. Prior to independence, the leaders wanted the youth to rise and revolt. Their problems were not favourably considered by the alien administration. The Universities were created to produce clerks who could only help in the perpetuation of British imperialism in this country. The students' problems received no recognition in the British hands. Consequently, an attitude of estrangement and anti-authoritarianism developed. This tendency of non co-operation with the administration has been in continuation since long. The then leaders have become rulers now but they never attempted a complete diagnosis of the disease. Remedy of the system might bring about occasional relief but not complete cure. Discussions, confabulations, conferences and deliberations have no meaning without concurrent implementation. On the chess-board of power-politics the leaders are so much engrossed in mutual struggle for political power that they have neither the time nor the thought to devote for the solution of the problems of youth. To say that "you are future", "you are shoulders", "be ready for future responsibility and leadership" sounds hypocritical, rather a political bluff. On the other hand, there is an attempt to suppress the students' demands by the help of police and army. The use of force to meet the problem will simply accentuate the problem rather than solve it.

Youth unrest is found to be a part of the general unrest all over the world. Further, youth unrest all over the world is the birth pang of a new society which is evolving. This unrest corresponds to the unrest which took place in the village life at the first stage of industrial revolution. In the post-industrial society intellect not business is the predominant element. Development of science and its sinister daughter Technology and enormous increase of Universities and Colleges have been producing a class which does not feel satisfied with the old and traditional leadership. It does not possess dash and drive, and lacks dynamism. To the youth the old leadership appears like a "huge circus with everybody running for money and status. The Adult tribe ap-

pears like a close room in the centre of which a gigantic rat race is going on". When the leaders of this largest democracy are indisciplined and are busy otherwise it is but natural for the youth to be more so. The unrest is more familiar to the developing countries. The contemporary political developments both at the Centre and the States affect the minds of the students. Eternal conflicts in the Ministries of most of the States cause dissatisfaction in the most normal circumstances. Can this dissatisfaction be suppressed by stationing armed forces in the University campuses? Recruitment to various services, including police and army is and will be made from among the students of these Universities.

In these circumstances, there is the necessity of constructive and positive thinking. Youth upsurge is to be tackled as a social and educational problem. The future leadership of the country is likely to come sometime upon the agitating youth of today. Lawlessness should not be encouraged by anyone and as such, the problem of youth indiscipline necessitate constructive approach by imaginative appreciation of their difficulties and problems.

SHAKESPEARE'S MACBETH

Edited with introduction, notes
and glossary

By

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VII Asian Games

Introduction

The Indian athletic contingent consisting of 22 men athletes, 6 women athletes and 2 coaches, participated in the VII Asian Games held in Teheran from 1st to 16th September, 1974. Shri G.S. Sivia was the manager. 29 members of the team reached Teheran on 26th August, 1974, along with the rest of the Indian contingent by a chartered Air India flight. The two American based athletes, Shri M.S. Gill and Shri M.G. Shetty reported directly there on 5th and 6th September, 1974 respectively. In Teheran, the contingent was warmly received by the Organising Committee at the airport. The Asian Games' village had nice, spacious, surroundings and was located at an altitude of nearly 4,000 ft. in a calm and quiet place. The organisers had made elaborate arrangements for the stay of the participants. The food provided was nutritious and to the liking of everybody.

Practice Schedule

The climate was almost the same as that of northern India in the month of November. Apart from the main track beautifully prepared in the Aryamehr Stadium, where the Asian athletic events were held, two practice tracks, one in tartan and the other in cyinder were prepared. The tartan and the cyinder tracks were allotted to the Indian team two hours daily on alternative days. However, Indian athletes mostly practised on the tartan track. The lodging place was located at a distance of about 10 kms. from the Sports Complex. Regular transportation was provided to cater to the needs of the teams whenever they wanted to go to the Sports Complex for regular training or for participation in the actual competitions.

Achievements

The Athletic events began on 9th September and continued till the afternoon of 15th September. The Indian athletes performed well and earned four gold medals, seven silver medals and four bronze medals. The credit of winning the coveted medals goes to the following athletes:

Gold Medals

- | | |
|------------------------|-------------|
| 1. Shri Sriram Singh | 800 Metres |
| 2. Shri Shivnath Singh | 5000 Metres |
| 3. Shri T.C. Yohanan | Long Jump |
| 4. Shri V.S. Chauhan | Decathlon |

Our Athletic Team in Teheran

G. S. SIVIA

Silver Medals

1. Shri Mahinder Singh Gill	Triple Jump
2. Shri Praveen Kumar	Discus Throw
3. Shri Shivnath Singh	10000 Metres
4. Shri Gurmej Singh	3000 Metres steeple chase
5. Shri Bahadur Singh	Shot Put
6. Shri Nirmal Singh	Hammer Throw
7. (i) Sriram Singh (ii) Shri Sucha Singh (iii) Shri Sucha Singh (iv) Shri Ajaib Singh	In 4 × 400 metres relay

Bronze Medals

1. Shri Lehember Singh	400 metres hurdles
2. Shri Satish Pillay	Long Jump
3. Shri Jagraj Singh	Shot Put
4. Shri Sursh Babu	Decathlon

For the comparative study of the performances of Indian athletes in the Teheran Asian Games and what they had most recently recorded in India, the necessary details are given in the table at page 13.

All the four gold medal winners created new Asian Games record. Svs. M.S. Gill, Praveen Kumar and the 4 × 400 metres relay quadruplet also bettered the Asian Games records; even though they achieved silver medals only. Svs. Satish Pillay, Jagraj Singh and Nirmal Singh (Hammer throw) recorded bettered performances in their respective events than what they had recently achieved in India. Svs. Lehember Singh, Gurmej Singh, Bahadur Singh and Suresh Babu almost repeated their expected performances sliding down marginally. This could be attributed to their psychological make up on the day of the competitions. In sports terminology, this is usually described as "match temperament". Some sportsmen do better in the competition, performance of some receive marginal set back depending upon their match temperaments. Shri Shivnath Singh recorded 13:34.19 secs. less over his best performance in 10000 metres, winning silver medal. Both the gold and bronze medal winners are from Japan. This event, as I could see, fell victim to the tactics of the two Japanese contenders. From the very beginning they were afraid of taking lead. Shri Shivnath, therefore, had to take the lead against his own will. This resulted in slowing down the speed of the race. Had the Japanese contenders offered tough competition to Shri Shivnath, the timings could have been much better. India has the misfortune of losing a gold medal in shotput. Shri Jalal Kashmiri of Iran was lucky to win the gold medal with his controversial fifth throw of over 18 metres. In the rest of his five throws he was trailing third. Shri Bahadur Singh was a bit disappointed because he could not get the required competition from Shri Jalal Kashmiri. Shri Ajmer Singh in Hammer Throw became the victim of bad luck. His two throws, declared foul, were near the silver

medal margin. The performance of Svs. M.C. Verghese and Sujata Kumar was below the expectations. Both of them lost a great deal in slow starts and, at the finish, they appeared to have become victims of "psychological complex". Shri Sucha Singh, though repeated his best performance in the heats, could not record the same timing in the final and thereby lost a medal. In the final, he made a mistake of getting away from its usual strides and went all out in the first three hundred metres with the result that he was almost completely exhausted at the finish and was overtaken by the athletes trailing him. We had a dismissal performance from Svs. M.G. Shetty and Jujhar Singh. M.G. Shetty did not appear to be in his best form. Shri Jujhar Singh attributed the reason of failure to his mis-calculation of warming up schedule. He told that he had almost completely cooled down inside the arena while going in for the trial throws. This resulted in a sudden jerk to his right arm which started paining. He was not, therefore, able to achieve the distance near his best performance.

Women Section

India has yet to cover a lot of ground to come up to a certain level of performance in comparison to the Asian standards in women events. None of the six athletes had any creditable performance except that Miss Anusuya Bai threw the discus marginally better than her best performances in the selection trials and Miss Marie Verghese recorded in 100 mts near her selection trials performance. We had a bit of hope of getting a medal in 4 × 100 metres relay but we lost the battle because the baton had fallen from the hand of our second leg after covering about 80 metres. Another dismissal performance was of Miss Angel Mary in High Jump. When asked to explain the reasons, she told that she had a muscular pain on her take up foot. The achievement of Miss Kusum Chhatwal in 100 m hurdles and in Pentathlon is also of no credit.

Conclusion

The athletic team had a happy time in Teheran remaining most of the time busy in their work up schedule or participation in their respective events. The facilities offered by the organising country in respect of the track, equipment, boarding, lodging, transport etc., were excellent. The climatic conditions also suited the Indian athletes. We had no indiscipline problem. Usually, the following day's programme was discussed on the previous night before going to the bed and it was followed in letter and spirit by every member of the team. The achievements of the Indian team are mainly due to the devoted and sincere efforts of the athletes and the coaches, particularly of Shri J.S. Saini. The AAFI has also to share the credit of imaginative and long planning of organising a series of coaching camps and offering facilities of participation to the prospective athletes in some International events prior to their having gone to Teheran.

Table showing the results of the Indian athletes in the VII Asian Games (Teheran)

Event	Name	Position	Performance	Recent best performance	Remarks
MEN					
1. 400 M	Sh. Sucha Singh	Vth	47.68/47.04 (H-IIInd)	47.04	
2. 800 M	Sh. Sriram Singh	Gold	1:47.57	1:49.6	NAGR
3. 5000 M	Sh. Shivnath Singh	Gold	14:20.50	14:30.08	NAGR
4. 10000 M	Shivnath Singh	Silver	30:51.01	30:16.2	
5. 100 M Hurdles	(i) M.G. Shetty	VIIth	14.96	14.2	
	(ii) M.C. Verghese	Vth (Heats)	15.30	14.24	
6. 400 M Hurdles	(i) Lehember Singh	Bronze	52.49	52.4	
	(ii) Sujata Kumar	8th	55.04/53.89 (H-IVth)	52.6	
7. 3000 M Steeple chase	Gurmej Singh	Silver	9:04.00	9:01.2	
8. Long Jump	(i) T.C. Yohanan	Gold	8.07 M	7.78 M	NAGR
	(ii) Satish Pillay	Bronze	7.58 M	7.44 M	
9. Triple Jump	(iii) M.S. Gill	Silver	16.25 M	10.69 M	Bettered AGR
10. Shot Put	(i) Bahadur Singh	Silver	17.94 M	18.44 M	
	(ii) Jagraj Singh	Bronze	17.64 M	17.61 M	
11. Discus Throw	(i) Praveen Kumar	Silver	53.64 M	52.52 M	Bettered AGR
	(ii) Bahadur Singh	IVth	51.58 M	51.70 M	
12. Javelin Throw	(i) Jujhar Singh	6th	62.70 M	70.36 M	
13. Hammer Throw	(i) Normal Singh	Silver	60.02 sec.	59.90 sec.	
	(ii) Ajmer Singh	IVth	58.88 sec.	60.26 sec.	
14. Decathlon	(i) V.S. Chauhan	Gold	7375	7302	NAGAR
	(ii) Suresh Babu	Bronze	6835	6874	
15. 4 × 400 M Relay	INDIA	Silver	3:08.73	3-12.0	Bettered AGR

NOTE: NAGR stands for New Asian Games Record.

WOMEN

1. 100 M	(i) Marie Verghese	VIth	12.57	12.5	
	(ii) Srirupa Chatterjee	VIth (Heats)	13.01	12.6	
2. 100 M Hurdles	Kusum Chhatwal	VIth	15.31	14.8	
3. Long Jump	Irene Saldanha	9th	5.06 M	5.30 M	
4. High Jump	Angel Marry	8th	1.50 M	1.62 M	
5. Pentathlon	Kusum Chhatwal	6th	3167	3280	
6. 4 × 100 M Relay	INDIA	5th	—	—	

A Study on Doctoral Dissertations

A.K. Srimany

The essence of a doctoral dissertation lies in an original contribution to or an establishment of facts in a chosen field. The path of such contributions reflects, in a way, the development of the subject. And as it is known, a special consideration is given to these contributors so far as their academic achievement is concerned. A study of such studies is of an immense interest to educational authorities and people at large.

The sources of information of this study are *Bibliographies of Doctoral Dissertations in India from 1857-1970* and *Universities Handbook, India, 1973*, two publications of Inter-University Board of India, New Delhi. The starting year of the former publication stands for nothing other than the time of formal establishment of the first three Indian universities (namely, Bombay, Calcutta and Madras). Dr. Amrik Singh, in the preface of these publications rightly says, "These bibliographies would chart, it is safe to assume, the course of development of the respective disciplines and, in a sense, would present the history of their growth in India. From this point of view these volumes would fill an important lacuna in the research information available".

The data pertaining to the published bibliographies on different available subjects upto 1970 give a comparative view in regard to the volume of studies in their path of development. This is given in Table 1.

Physics tops the list followed up Economics and Mathematics. Subjects like Commerce, Astronomy, Geography, Law and Public Administration have notably less studies. Interestingly, however, foreign languages like Chinese, French and German are covered in the list.

The time series data regarding the distributions of dissertations for a few subjects are given in Table 2 (on page 15). It reveals that prior to 1941 comparatively much work was done in Physics, Barring Economics, the studies in Social Sciences have less heritage. The second part of Table 2 gives percentage *cumulative distributions*. It gives us proportions of studies done in recent years and beyond. It shows that during the last 10 years, 73% of work was done in Physics, 63% in Economics, 77% in Mathematics, 66% in Sociology, 73% in Political Science, 72% in Education and 80% in Psychology. This indicates in general that most of the work done has been during the last decade only.

One would like now to see what type of mathematical trends exist and try to estimate them. The trend equations for different subjects are given in Table 3 (page 15).

TABLE 1

Doctoral Dissertations in Different Subjects in India upto 1970*

Sr. No.	Subjects	No. of Dissertations
1.	Astronomy	27
2.	Chinese	1
3.	Commerce	122
4.	Economics	1,035
5.	Education	322
6.	English	354
7.	French	5
8.	Geography	182
9.	German	1
10.	Journalism	7
11.	Law	67
12.	Library Science	4
13.	Management	82
14.	Mathematics	912
15.	Physics	1,753
16.	Political Science	389
17.	Psychology	211
18.	Public Administration	150
19.	Sociology	425
20.	Statistics	142

*Along with bibliographies on other subjects yet to be published. Chemistry, in fact, has maximum of such dissertations.

For Physics, Economics, Mathematics and Sociology exponential curve and for the rest, straight line was fitted. This has an implication that the number of dissertations appears to be increasing at an increasing rate for the first four subjects, while for the rest, increasing at a constant rate. The computed coefficients of determination help in assuming the fits to be acceptable. These trend equations may be exploited for predicting the supply of doctoral dissertations for a few future years.

A glance at the university performance in this regard may be opted to be supplemented. Taking the seven subjects together out of 65 universities producing dissertations, only 19 were established before 1947. The performances in terms of percentage in the production of dissertations in different subjects during the last decade is shown in Table 4 (page 16).

TABLE 2

Frequency and Percentage Cumulative Frequency Distributions of Doctoral Dissertations in Different Subjects, 1857-1970

Year	FREQUENCY							PERCENTAGE CUMULATIVE FREQUENCY						
	Phys- ics	Eco- nomi- cs	Maths	Soc- io- logy	Pol. Sc.	Edu- ca- tion	Psy- cho- logy	Physics	Econo- mics	Maths.	Socio- logy	Pol. Sc.	Educa- tion	Psycho- logy
Upto 1940	69	24	26	6	8	—	3	100.00	100.0	100.00	100.0	100.0	100.0	100.0
1941	3	5	1	1	—	—	—	96.1	97.7	97.1	98.6	97.9	100.0	98.6
1942	4	2	2	3	4	—	—	95.9	97.2	97.0	98.3	97.9	100.0	98.6
1943	8	3	3	5	1	2	—	95.7	97.0	96.8	97.6	96.9	100.0	98.6
1944	6	3	5	6	2	—	2	95.2	96.7	96.5	96.5	96.7	99.4	98.6
1945	8	6	2	4	1	1	—	94.9	96.5	95.9	95.1	96.1	99.4	97.6
1946	7	7	2	1	1	1	—	94.4	95.1	95.7	94.1	95.9	99.1	97.6
1947	3	10	2	6	1	1	—	94.0	95.2	95.5	93.9	95.6	98.8	97.6
1948	6	8	9	2	—	1	—	93.8	94.2	95.3	92.5	95.4	98.4	97.6
1949	10	13	6	4	2	3	—	93.5	93.4	94.3	92.0	95.4	98.1	97.6
1950	7	14	3	7	1	1	1	92.9	92.2	93.6	91.1	94.9	97.2	97.6
1951	15	18	4	8	2	4	1	92.5	90.8	93.3	89.4	94.6	96.9	97.2
1952	20	28	9	5	6	6	2	91.7	89.1	92.9	87.5	94.1	95.6	96.7
1953	19	15	7	3	5	6	3	90.5	86.4	91.9	86.3	92.5	93.8	95.7
1954	27	29	14	8	5	7	4	89.5	84.9	91.1	85.6	91.3	91.9	94.3
1955	33	29	15	5	8	6	2	88.0	82.1	89.6	83.8	90.0	89.7	92.4
1956	30	25	11	8	5	5	2	86.1	79.4	87.9	82.6	88.0	87.9	91.5
1957	42	25	14	14	11	9	5	84.4	77.0	86.7	80.7	86.6	86.3	90.5
1958	40	28	17	12	15	8	4	82.0	74.6	85.2	77.4	83.8	83.5	88.1
1959	57	44	28	19	11	14	5	79.7	71.9	83.3	74.6	79.9	81.1	86.3
1960	61	53	31	16	15	15	8	76.4	67.6	80.3	70.1	77.1	76.7	83.9
1961	65	32	23	14	19	15	13	73.0	62.5	76.9	66.3	73.3	72.0	80.1
1962	82	49	27	18	15	16	2	69.2	59.4	74.3	63.1	68.4	67.4	73.9
1963	103	50	43	18	27	21	13	64.6	54.7	71.4	58.8	64.5	62.4	73.0
1964	76	63	59	20	30	18	19	58.7	49.9	66.7	54.5	57.6	55.9	66.8
1965	89	51	45	28	22	20	13	54.4	43.8	60.2	49.9	49.9	50.3	57.8
1966	148	73	73	23	25	30	17	49.3	38.8	55.3	43.3	44.2	44.1	51.7
1967	159	64	110	43	36	29	17	40.8	31.8	47.3	37.9	37.8	34.8	43.6
1968	183	90	124	36	31	35	25	31.8	25.6	35.2	27.8	28.5	26.1	35.5
1969	208	97	86	41	38	29	28	21.3	16.9	21.6	19.3	20.3	15.2	23.7
1970	166	78	111	41	41	20	22	9.5	7.5	12.2	9.6	10.5	6.2	10.4
TOTAL	1753	1035	912	425	389	322	211							

TABLE 3

Estimated Trends in Different Subjects

Sr. No	Subject	No. of observations	Trends equation*	Coefficient of determination	Remarks
1.	Physics	30	$\gamma = 33.12(1.07)t$	0.92	t units, $\frac{1}{2}$ year origin 1955-56
2.	Economics	30	$\gamma = 20.42(1.06)t$	0.72	As above
3.	Mathematics	30	$\gamma = 13.19(1.08)t$	0.92	As above
4.	Sociology	30	$\gamma = 8.91(1.05)t$	0.81	As above
5.	Political Science	30	$\gamma = 12.97 + 0.67t$	0.85	As above
6.	Education	28	$\gamma = 11.50 + 0.58t$	0.86	t units, $\frac{1}{2}$ year origin 1956-57
7.	Psychology	21	$\gamma = 9.81 + 1.25t$	0.81	t units, 1 year origin 1960

* γ denotes no. of dissertations and
t denotes time as defined in remarks.

TABLE 4

University Performance in the Production of Doctoral Dissertations during 1961-70

Sr. No.	Subject	P.C. share of total volume of dissertations during 1961-70, by	
		Pre-independence universities	Post-independence universities
1. Physics		73	27
2. Economics		63	37
3. Mathematics		46	54
4. Sociology		67	33
5. Political Science		55	45
6. Education		60	40
7. Psychology		78	22

It is seen that pre-independence universities have contributed more dissertations during this period than post-independence universities in all subjects with only exception in Mathematics.

In the light of universities to their output of doctoral dissertations upto 1970, the old universities get an advantage over the new. To isolate this factor, they may again be ranked in terms of their performance during the last decade. This is given in Table 5.

One revealing feature of this table is that the name of Agra University appears somewhere in five subjects out of seven and Bombay in four. For Physics and Psychology Calcutta comes first in total volume upto 1970 as well as during the last decade, same is the case with Agra for Economics. But for the rest of the subjects such consistent picture does not exist. Relatively less aged institutions like I.I.T., Kharagpur in Mathematics, Indian School of International Studies in Political Science and M.S. University of Baroda in Education are in the front-rank, if the last decade is considered. For Sociology, Agra has highest number during the decade.

Without any pretence it is, however, to be noted that, without factors like volume of resources (may be measured by post-graduates), opportunity of research and others, and due to lack of scientific studies in the arena of equivalence of academic standard, be it in undergraduate, postgraduate or anywhere, the question of adequacy of such a comparative study remains open. Nevertheless, this study reflects the dynamics in the flow output in terms of crude numbers.

TABLE 5

Top Universities Producing Doctoral Dissertations in Different Subjects*

Sr. No.	Subject	Top Universities (upto 1970)	Top Universities (during 1961-70)
1. Physics		Calcutta (302) Bombay (161) Andhra (133)	Calcutta (214) Bombay (106) (B.H.U. (98)
2. Economics		Agra (240) Bombay (137) Lucknow (99)	Agra (128) Bombay (48) Lucknow (47)
3. Mathematics		Calcutta (84) I.I.T., Kharagpur (68) Lucknow (47)	I.I.T., Kharagpur (59) B.H.U. (45) Calcutta (41)
4. Sociology		Bombay (100) Lucknow (74) Agra (73)	Agra (59) Lucknow (45) Bombay (27)
5. Political Science		Agra (52) Lucknow (43) I.S.I.S. Delhi (35)	I.S.I.S., Delhi (35) Agra (31) Vikram (18) Lucknow (18)
6. Education		Bombay (53) Baroda (30) Allahabad (23)	Baroda (23) Bombay (19) Agra (15)
7. Psychology		Calcutta (43) Agra (19) B.H.U. (18)	Calcutta (31) Agra (19) B.H.U. (13)

*Figures in brackets indicate respective number of dissertations.

Round Up

Times Higher Education Supplement

Third World Fellowship 1975

THE ASSOCIATION of Commonwealth Universities, London, has received a generous gift from the Times Higher Education Supplement for enabling the Association to promote a fellowship for three years. Under this programme persons from universities in a developing country can visit another developing country to study or to obtain greater experience and training of a kind that would be beneficial to his own university and country. Last year the successful candidate in the competition was Dr. F. O. Kwami of the Faculty of Engineering, University of Science and Technology, Ghana. He is being supported for a month's visit to India where he will study mechanisation of small industries and farms.

Nominations for this year are invited for the award from universities in the developing countries. No hard and fast rules for the award of the fellowship have been laid down. However, the kind of project in which the Association would be keen to support an applicant could well fall into one of the following categories:

(a) the attainment of a staff member, either academic or administrative, to a university in *another developing country* in the commonwealth, to obtain greater experience and training;

- ing;
- (b) the provision for a member of university staff of an opportunity to make a short study tour of *other Commonwealth developing countries* to enhance his ability to contribute to national development;
- (c) visit by a staff member to a university in another developing country with a particular developmental objective in mind.

The award will not be confined to people holding staff positions. An applicant who is a graduate and whose research project or training programme had a particular developmental objective could also be considered. The nominations should reach the Secretary-General, Association of Commonwealth Universities, 36 Gordon Square, London, not later than **31st January 1975**. Information should include a copy of the candidate's curriculum vitae and a detailed proposal of the particular study tour, visit or attachment which is proposed for the applicant. As far as possible, information with regard to the cost of the programme and the extent to which that programme is already supported by the university or by grant, scholarship, endowment of any kind from any other source, has also to be provided. The Association may, in special

circumstances, recommend a single award not exceeding £1,000 or alternatively more than one award up to this total sum.

The award is intended only for candidates from developing countries and for projects within those countries; applications for study in or exchange with universities in the developed world cannot be entertained. All applications should be sponsored and duly forwarded by the Vice-Chancellor of a candidate's own university. Applications from individual scholars will not be entertained.

British Books For B.H.U.

THE British Government has presented a collection of books to the newly created Department of Journalism and Mass Communication of Banaras Hindu University (BHU).

The books deal with various aspects of journalism and broadcasting. Among the subjects covered are newspaper management and design, the history of broadcasting in Britain, television production, educational television, and law for journalists.

The books were presented to the Department by Mr. S. E. Hodgson, Education Adviser to the British High Commissioner, recently at a function held at Varanasi.

PG Course In Pharmaceutical Chemistry

THE Gujarat University has received a donation of Rs. 5 lakhs for instituting a two years' Post-graduate course in Pharmaceutical Chemistry from the Damodardas Charity Trust, Bombay. Sheth Ramanlal Damodardas, his son Niranjanbhai and the family donated this in the memory of Sheth Damodardas, the founder of their firms. The Damodardas Institute of Pharmaceutical Chemistry will provide facilities for

research and training in Pharmaceutical Chemistry at the Post-graduate level from June 1975.

11 courses proposed

The Gujarat University has proposed to the State Government and through them to the Planning Commission, 11 courses as listed below, under their employment generation schemes:

- (1) Office Management
- (2) Bank Management
- (3) Financial Management
- (4) Exports Business Management
- (5) Materials Management
- (6) Marketing and Salesmanship (Textiles)
- (7) Stenography and Secretarial Practice
- (8) Bank Recruitment Test Training Programme
- (9) Research Methodology
- (10) Instrumentation
- (11) Photographic Art

Foreign Journalists At PAU

Mr. William C. Mullen, Reporter of the *Chicago Tribune* accompanied by Mr. Ovie Carter, photographer, came to the Campus on August 29. They were here to study the green revolution.

Mrs. Mary King Rose, Representative of the Public Television USA, who is making a two-hour film on the global food situation, also visited the University on the same day.

Both, Mr. Mullen and Mrs. Rose, met Dr. M. S. Randhawa, Vice-Chancellor, separately and discussed with him in detail the future of agriculture and food production, keeping in view the shortage of power, fertilizer and high cost of agricultural inputs.

The Vice-Chancellor stressed the point that no number of green revolutions would be able to feed the growing population. "We shall have to put a stop to the increasing numbers", he added. The Vice-Chancellor also said that to meet the power crisis, "we will have to tap the abundant resources lying buried in the Himalayas".

Medical Research

Nuclear Medicine

RADIOACTIVE substances are used in modern medicine not only as radiation sources for the treatment of cancer and other diseases, radioactive tracers in clinical diagnostic and investigative procedures, and in various fields of medical research. Nuclear medicine is now widely recognized as a separate medical speciality.

The radioactive tracer techniques of labelling a component with an appropriate radioactive substance, and then following its fate within the body's system by the radiation emitted by the label, is a powerful method of investigation, with many applications in clinical diagnosis.

These applications fall into three main categories:—

—In the first category are imaging procedures for the delineation of organs or tissues of the body, or the detection of tumours, cysts or other lesions. These procedures depend on the administration of radioactive drugs (radiopharmaceuticals) that are absorbed by the organ or tissue interest, and the subsequent mapping of the distribution of radioactivity in the body of the patient.

—In the second category are procedures for the investigation of various aspects of the composition of the body and the functional state of its organs and tissues. These procedures depend on observations of the distribution, metabolism and excretion of administered radiopharmaceuticals.

—The third category comprises assay procedures for the measurement of hormones, vitamins and similar substances in blood or other specimens. These procedures do not involve the administration of any radioactive substances to the patient, but only their addition to the specimen after its collection.

Many such applications are now considered part of routine

medical practice, and no major hospital should be without the means to carry these out.

Research

In medical research, radioactive substances find especially important applications as radioactive tracers in the field of biochemistry, cardiology endocrinology, gastroenterology, haematology, immunology and microbiology, and in nutritional studies.

The programme of the International Atomic Energy (IAEA) on medical applications for the six-year period 1975-80, elaborated in close co-operation with the World Health Organization (WHO), covers many different areas of nuclear medicine. The programme includes the provision of experts, equipment and training opportunities to developing countries to assist them to initiate and enlarge their own relevant programmes, the support of research through Research Contracts and Agreements, the organization of symposia and other meetings, and the publication of their proceedings and other reports. It is supported by various activities in the IAEA Laboratory at Seibersdorf, just outside Vienna.

Of particular interest in this programme are certain co-ordinated research programmes between a number of institutes in different countries with the IAEA acting as the co-ordinator.

One such project relates to process the information obtained in imaging procedures by computer, so as to improve the quality and readability of the images obtained. Such techniques should provide more reliable detection of tumours and other lesions.

Another project gives particular attention to the development of radioimmunoassay procedures for the measurement of the hormones associated with human reproduction, which find applications not only in clinical

medicine, but also in studies aimed at controlling the so-called population explosion. Such procedures are based on the reaction between the substance to be measured and the antibodies in an antiserum to that substance.

Yet another project relates to the development of simple procedures, again based on antigen-antibody reactions, for measuring on a small blood sample the degree of immunity of an individual towards a particular infection. Such procedures may prove useful in determining the immunological status of populations at risk in outbreaks of diseases such as cholera or plague, to be able to estimate the need for vaccination programmes, as well as to evaluate the efficacy of such programmes.

In a fourth project, developed jointly with WHO, the levels of various trace elements, notably cadmium, chromium, copper, selenium and zinc in specimens of human tissues are measured by neutron activation analysis in order to determine their possible role in the causation of different diseases. So far, the project has been mainly concerned with cardiovascular diseases. Neutron activation analysis in which the specimens are first subjected to an intense flux of neutrons in a nuclear reactor, whereby the various elements present are rendered radioactive and can be identified in terms of the radiations that they emit is one of the very few available techniques having the sensitivity needed for the measurement of the minute amounts of the trace elements present.

Iron-deficiency anaemia, a world-wide public health problem, is the subject of a fifth project also developed jointly with WHO. In this project, radioactive tracer techniques are being used to study the gastro-intestinal absorption of iron from various diets, and to seek ways of improving nutrition by adding either iron-containing substances or substances that promote iron absorption to the diet.

The IAEA will continue to promote and support these important contributions of nuclear medicine to health and welfare.

(Courtesy : UN Weekly Newsletter)

Method to Improve Management Ability

A NEW METHOD of improving management ability in the "third world" goes into operation with the launching of an International Labour Office programme to provide advanced international training for managers from developing countries.

The Swedish International Development Authority will finance the five-year scheme at a total estimated cost of \$633,700.

This will provide for a yearly average of 13 managers from developing countries to attend programmes of up to nine months at the Centre for Industrial Studies, an independent management development institute in Geneva. Participants will work alongside

executives from developed countries who are drawn from the world of international business.

The new activity complements the national management development projects which are being carried out by the ILO in more than 40 developing countries, and is designed to serve the same aim, that of producing the competent managers needed to achieve further economic and social progress.

Applicants will be selected from among the following: government officials concerned with economic development, planning, industry, commerce or foreign trade; development banks, management development and productivity institutes and management associations; enterprises in the public sector; trade unions; and local private firms.

Proper Strategy For Food Production

THE NECESSITY of developing a proper strategy by the Agricultural Universities in the country for increasing food, fiber & fodder production was stressed recently by Dr. M. S. Swaminathan, Director-General, Indian Council of Agricultural Research (ICAR). He was addressing a conference of Vice-Chancellors of the various Farm Universities in the country at the Andhra Pradesh Agricultural University (APAU).

Dr. Swaminathan advised the Vice-Chancellors to plan a programme of action to meet the present day shortages by adopting measures to ensure the maximum results with the use of the available inputs.

He requested the formulation and implementation of action programmes as a follow-up to the memorandum submitted by the Vice-Chancellors to the Prime Minister recently in which they had pledged their support and

involvement in increasing agricultural production in the country. He also stressed increased community participation in the programmes for increasing agricultural production.

The Vice-Chancellors later explained the follow-up action taken by their Universities since submitting the memorandum to the Prime Minister.

Besides, the Vice-Chancellors and representatives of the ICAR, Dr. Nicholson, Chief of the United Nations Development Programmes (UNDP) in India was also present.

During the conference, the Vice-Chancellors discussed the various problems confronting agricultural research, education and allied aspects in addition to the ways and means of improving agriculture in all its aspects in coordination and cooperation with the ICAR and the Government of India.

Laboratories Inaugurated

DR. M. S. SWAMINATHAN, Director-General, Indian Council of Agricultural Research (ICAR) also declared open the laboratories of the All India Coordinated Project for Poultry for Eggs at the Andhra Pradesh Agricultural University (APAU) Poultry Research Institute, Rajendranagar on this occasion. Dr. Swaminathan and the Vice-Chancellors went round the laboratories where they were explained the modern equipment that was installed as also the achievements of the various research projects of the institute and the working of the project.

They also visited the Live

Stock Research Institute, the Agricultural Research Institute and the College of HOME-SCIENCE of the APAU. The All India Coordinated Rice Improvement Project and the All India Coordinated Sorghum Project were also visited where the All India Coordinators explained the work which was being done.

The Vice-Chancellors also visited the All India Coordinated Research Project for Dryland Agriculture at Hayatnagar and the whole farm demonstrations conducted by the APAU at Hayatnagar. A visit to International Crop Research Institute for Semi Arid Tropics (ICRISAT) rounded-off the three day conference of the Vice-Chancellors where they were explained the results of research and the achievements of these projects.

Dr. Randhawa

DR. M. S. Randhawa, Vice-Chancellor, PAU, has been appointed Chairman of the Committee of Experts to advise the ICAR on publicity and sales promotion efforts for scientific books, bulletins and journals for dissemination of research results in the field of agriculture, animal husbandry and allied subjects.

N.I.S. Branch at Bangalore

THE Netaji Subhas National Institute of Sports have decided to establish the South Branch of the Institute at Bangalore. A decision to this effect was taken at a meeting held at New Delhi between the Chief Minister, Karnataka, Mr. Dev Raj Urs, the Chairman, SNIPES, Mr. Ram Niwas Mirdha and Mr. Shahid Alikhan, Joint Secretary, Ministry of Education. Following this, the Director, NIS air-dashed to Bangalore to discuss further details with the Chief Secretary, Karnataka. According to the details worked out, the Government of Karnataka will place at the disposal of NIS for 7 years the Kanteerava Stadium, the Youth Centre building and the premises at present occupied by the Government College of Physical Education.

Pantnagar Fair

Many New Attractions

THE All-India Farmers' Fair was held at Pantnagar from 25 September to 1 October 1974. The main highlights and special attractions of the Fair were:

The visiting farmers were apprised of the latest technical know-how about successful cultivation of important *kharif* crops like rice, maize and soybean. They got an opportunity to see the promising varieties of tomorrow. Besides, they were shown the Livestock Research Station, Crop Research Station and Seed Processing Plants etc. so that they may be acquainted with the latest development in the field of agriculture.

A minikit of seeds of rare varieties of wheat, gram and lentil were provided to the visiting farmers on payment. Improved *rabi* seeds, rhizobium culture for pulse crops, seedlings of fruit and vegetable crops etc. were sold at the Fair.

A large number of farmers from different parts of India and Nepal attended the week-long Fair.



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SAMBALPUR UNIVERSITY JYOTI VIHAR, BURLA

Advertisement

No. 27012/TDS. Dt. 16-9-74

Wanted

Name of the Post : Lecturer in History-
One post.

Nature of the Post : Temporary.

Scale of Pay : Rs. 400-40-800-50-950.

Essential qualification

1. Atleast a Second Class Master's Degree in History with 48% marks.
2. Teaching/Research experience will be regarded as an Additional qualification.

Desirable qualification :

Specialisation in Ancient Indian History and Archaeology.

The post carries usual dearness allowance as would be sanctioned by the University from time to time.

Seven copies of the application forms will be supplied from the University Office to each candidate in person on cash payment of Rs. 2,- (Rupees two) only. Candidates intending to receive forms by post are required to send (a) Crossed postal order of Rs. 2,- payable to the Finance Officer, Sambalpur University, Jyoti Vihar, Burla (b) A self addressed envelope (23 cm. x 10 cm.) with postage stamps worth Rs. 2,- affixed to it with the words, 'APPLICATION FORM FOR TEACHING POSTS IN SAMBALPUR UNIVERSITY' superscribed on it. Money order/cheque will not be entertained.

The last date of receipt of applications in the office of the University at University Campus, Jyoti Vihar, Burla, Sambalpur (Orissa) is 16-10-74. The candidates will be required to appear for an interview before a Selection Committee at their own expenses.

All communications should be addressed to the Registrar by designation only.

REGISTRAR

SAURASHTRA UNIVERSITY

Applications in the prescribed forms are invited for the posts of (i) Professor in Home Science : Pay Scale Rs. 400-30-640-40-800 (ii) Lecturer (Junior Scale) in (1) Economics (One post) (2) Persian (One Post) : Pay Scale Rs. 300-25-600.

All posts are permanent and carry benefits of contributory provident fund as per University Rules. Post No. ii (1) & (2) for University Colleges at Bhavnagar. Dearness Allowance and House Rent Allowance will be paid as per University Rules. Higher initial

salary in the scale may be considered in case of exceptionally qualified and experienced persons. Qualifications and experience relaxable in special cases. Candidates in employment must submit their applications through their present employer. Candidates if not knowing Gujarati will be required to pick up Gujarati within a reasonable period.

Age ordinarily not exceeding 55 years.

Application forms will be available from the Registrar, Saurashtra University, University Campus, Kalawad Road, Rajkot on sending a self addressed envelope of the size 23 x 11 cms with postage stamps worth 0-65 paise.

Application in six copies for the post No. i and four copies for the post No. ii(1) and (2) accompanied by Indian Postal Order for Rs. 2-50 crossed in favour of Registrar, Saurashtra University, University Campus, Kalawad Road, Rajkot should reach this office on or before 15-10-74.

INDIAN INSTITUTE OF TECHNOLOGY KANPUR IIT POST OFFICE KANPUR

CORRIGENDUM

Corrigendum to our Press Advertisement No. 22/74 regarding recruitment to the posts of Administrative Officer, Civic Administrator and Staff Welfare Officer at IIT/Kanpur.

- (1) Read pay scales at Sl. No. 1 and Sl. No. 2 : Rs. 1600-100-1800 instead of Rs. 1600-100-1900
- (2) The posts are reserved for SC/ST candidates. However, if suitable SC/ST candidates are not available the posts may be filled up by other candidates.

Application can now be sent to Registrar, Indian Institute of Technology, Kanpur, IIT Post Office, Kanpur-208016 latest by 15-10-1974. Those who applied earlier in response to Advt. No. 22/74 need not apply again.

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE, LAW COLLEGE ROAD : POONA-4

Applications are invited for the following posts :

- (a) Readers in : (1) Zoology (Genetics/Protozoology/Entomology) (2) Chemistry (Biochemistry/Organic Chemistry)

Pay Scale : Rs. 700-50-1250 plus allowances.

Qualifications : (1) Doctorate degree in the subject from recognized University. (2) Research publications of recognized merit other than thesis. (3) Experience in

Post-graduate research guidance and teaching. (4) Experience in Laboratory Organisation.

- (b) Senior Research Assistants in : (1) Geology (Palaeontology) and (2) Chemistry (Biochemistry/Organic Chemistry)

Pay Scale : Rs. 325-575 plus allowances.

Qualifications : Essential-M.Sc. degree in the subject. Desirable-Ph.D. Research experience in (1) Palaeontology (2) Organic Chemistry or Biochemistry with publications.

Applications stating age, qualifications, experience, etc. should be sent to the Director, Maharashtra Association for the Cultivation of Science, Law College Road, Poona-4 on or before 31st October, 1974.

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY, P.O. I.I.T. POWAI, BOMBAY-76.

Advertisement No. 786/74

Applications stating particulars of qualifications, experience, age, previous employment, salary drawn and scale etc., are invited on or before 21st October, 1974 by the Registrar, Indian Institute of Technology, Bombay, for the post of P.T. Instructor. Enclose crossed Indian Postal Order for Re. 1/- (25 paise for Scheduled Caste/Tribes Candidates). Applicants already in Government/Semi Government Organisations and Educational Institutions must apply through proper channel.

Scale:—Rs. 425-15-500-EB-15-560-20 640-EB-20-700-25-750 plus usual allowances.

Age:—Below 35 years.

Qualifications:—

1. Essential: Degree of Bachelor of Physical Education with a high second class

or

Bachelor's degree with a Diploma in Physical Education from a recognised Institution.

2. Desirable:—A coaching certificate in Athletics from the National Institute of Sports.

Candidates with previous experience in residential Institutions will be given preference.

Qualification relaxable in the case of candidates of proven ability with adequate number of years of service and experience.

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY, P.O. I.I.T., POWAI, BOMBAY-76

Advertisement No. 787/74

Applications are invited for the following faculty positions in the Departments of Aeronautical Engineering, Me-

CURRENT DOCUMENTATION IN EDUCATION

A list of select articles culled from periodicals received in AIU Library during
August-September 1974

EDUCATIONAL SOCIOLOGY

- Amrik Singh. "Emerging student power in India." *University News* 12(6); June 74 : 4-5.
- Das, D.P. "Indian youth : A profile." *Mainstream* 12(50); 10 Aug 74 : 15-19, 22.
- Dickson, David. "Academics for poverty open third world campaign." *Times Higher Education Supplement* (133); 3 May 74 : 7.
- Ferriman, Annabel. "Leaping forward by choosing the hardest way." *Times Higher Education Supplement* (128); 29 March 74 : 11.
- Flew, Antony. "Academic disruption." *Times Higher Education Supplement* (137); 31 May 74 : 14.
- Fonseca, C. "Student power in Gujarat." *New Frontiers in Education* 4(2); Apr 74 : 88-94.
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UNIVERSITY OF DELHI

Advt. No. Estab. IV/24/94

Applications on the prescribed form are invited for the following posts :

1. College of Medical Sciences : One Professor of Pharmacology.
2. Economics : One Professor (Temp. upto 3-1-1976), One Lecturer (Temp. upto 20-8-1976).
3. Commerce : Two Readers (For South Campus).
4. Psychology : One Reader (Temp. upto 15-8-1976).
5. Faculty of Law : Two Readers (One of which is temporary but likely to continue); Three Lecturers (One of which is temporary upto 2-9-1975) Two Part time Lecturers.
6. Evening Law Centre No. I : Lecturers.
7. Evening Law Centre No. II : Four Part time Lecturers.
8. Faculty of Mathematics : One Lecturer (For Evening Classes).
9. Operational Research : Two Lecturers (Temp., One is upto 20-8-1975 and the other likely to continue).
10. Zoology : One Lecturer.
11. Modern Indian Languages : Lecturer in Bengali (Temp. upto 15-5-1975).
12. Faculty of Music and Fine Arts : Two Investigators (One for Hindustani Music and one for Karnatak Music).
13. Central Office : Planning Officer.
14. Computer Centre : Two Console Operators.

The scales of pay of the posts are :

1. Professor of Pharmacology : Rs. 1100-50-1300-60-1600 plus Non-Practising Allowance of Rs. 500/- P.M. (For those having medical qualifications)
2. Professor : Rs. 1100-50-1300-60-1600.
3. Reader : Rs. 700-50-1250
4. Lecturer : Rs. 400-40-800-50-950
5. Part time Lecturer : Rs. 500/- P.M. (fixed).
6. Investigator : Rs. 300.- P.M. (fixed).
7. Planning Officer : Rs. 700-50-1250.
8. Console Operator : Rs. 550-25-750-EB-30-900 (Revised).

All posts carry D.A., C.C.A., H.R.A. and retirement benefits (in case of permanent incumbents) as admissible under the rules in force from time to time. The scales in respect of posts at Sl. Nos. 1, 2, 3, 4 and 7 are likely to be revised.

I. ESSENTIAL QUALIFICATIONS FOR :

1. Professorship in Pharmacology : M.B., B.S., M.D. (Pharma. & Therapeutics) / M.D. / M.Sc. / Ph.D. / D.Sc. (Pharmacology).

Teaching/Research Experience : As Associate Professor/Reader in Pharmacology for five years in a Medical College.

2. Professorship in Economics : A Scholar of eminence. Independent published work of high standard and experience of teaching Post-graduate

classes and guiding research for a considerable period desirable.

3. Readerships : Good academic record with first or high Second Class Master's Degree in the subject concerned with a Doctoral Degree or equivalent published work.

Independent published work (in addition to the published work mentioned above) with at least 5 years' teaching experience in Honours/Post-graduate Classes essential.

4. Lecturerships : Good academic record with first or high Second Class Master's Degree or an equivalent Degree of a Foreign University in the subject concerned.

5. Part-time Lecturers in Law : Good academic record with first or high Second Class Bachelor's or Master's Degree in Law. Practice at the Bar for at least 5 years of which at least 3 years should have been in the Trial Courts. Previous teaching experience desirable.

6. Investigator (Hindustani Music) : Master's Degree with a 1st or High II Class. Experience in collecting references and research work. Ability to assist the Professor (Hindustani music) in his/her research work. Knowledge of the following languages : Sanskrit, Hindi and English.

7. Investigator (Karnatak Music) : Master's Degree with 1st or High II Class. Experience in collecting reference and research work. Ability to assist the Professor (Karnatak Music) in his/her research work. Knowledge of following languages : English, Telugu and Sanskrit.

8. Planning Officer : (a) A good Post-graduate Degree, (b) Experience of educational administration for at least 8 years.

9. Console Operators : (a) At least Second Class (50% marks in the aggregate) Master's Degree in Mathematics, Statistics, Econometrics, Operations Research or Physics; OR At least a Second Class (50% marks in the aggregate) Bachelor's Degree in Engineering from a recognised institution; (b) Familiarity with Console Operation.

II SPECIAL DESIRABLE QUALIFICATIONS FOR :

1. Professorship in Economics : The candidate should have specialization in both—analytical and empirical aspects of Public Economics.

2. Readership in Commerce (South Campus) : Specialisation in (i) Organisation Theory and Behaviour (ii) Tax laws and Practice. Preference will be given to a person, who is a Chartered Accountant also.

3. Lecturership in Operational Research : Specialisation in Computer Programming Decision Theory/Theory of Marketing Reliability Theory is highly desirable.

4. Lecturerships in Law (E.L.C. No. 1) : Persons with teaching experience

and Research in Law would be preferred.

5. Lecturership in Zoology : M.Sc./Ph.D. in Zoology with Biochemistry or M.Sc./Ph.D. in Biochemistry. Teaching and research experience in Biological Chemistry is desirable.

6. Investigator in Hindustani Music : Experience in Translation work. Experience in writing articles and preparing reports. Knowledge of any two of the following languages : Marathi, Bengali, Gujarati, Punjabi and Urdu.

7. Investigator in Karnatak Music. Experience in writing articles and preparing reports. Experience in translation work. Knowledge of any two of the following languages : Tamil, Malayalam and Hindi.

8. Planning Officer : Experience of University administration, familiarity with the working of the University Bodies/Institutions and work relating to planning, development, statistics and utilisation of development funds.

9. Console Operator : Knowledge of Fortran Programming.

10. Part-time Lecturership in Law : A part-time teacher shall be appointed for a period of one year in the first instance, and his appointment may be extended for a further term not exceeding two years, provided that the services of a part-time teacher in similar circumstances may be extended for a further term not exceeding two years. In no case shall be a part-time teacher work for more than five consecutive years in all.

The prescribed application form can be had from the Information Office of the University either personally or by sending a self-addressed envelope (5" x 11") with postage stamps worth Rs. 1-75.

Selected candidates will have to produce the original documents relating to their age, qualifications, experience, etc. before joining the appointment.

Application accompanied by attested copies of Degrees and other certificates, etc. should reach the undersigned not later than 21st October, 1974.

Note :

1. It will be open to the University to consider the names of suitable candidates for teaching posts who may not have applied. Relaxation of any of the qualifications may be made in exceptional cases in respect of all posts on the recommendations of the Selection Committee.

2. Convassing in any form by or on behalf of the candidate will disqualify.

3. Candidates from outside Delhi for posts at Sl. Nos. 1 to 11 called for interview will be paid $\frac{1}{2}$ Second Class Fares as per contribution as per rules.

4. Certain percentage of posts in the cadre of non teaching posts are reserved for Scheduled Castes/Tribes and Ex-servicemen.

REGIS TRAR



Fly with your flag.

Remember the joy when you first saw your flag being hoisted. As if your heart would take wing, as if it would flutter in the wind along with the flag.

And remember how proud you were because it gave you a place, a unique place, among other flags, other countries, other peoples.

So also today, your flag flies for everything distinctively yours, distinctively Indian. Air-India is your country's flag-carrier. It carries your country's history,

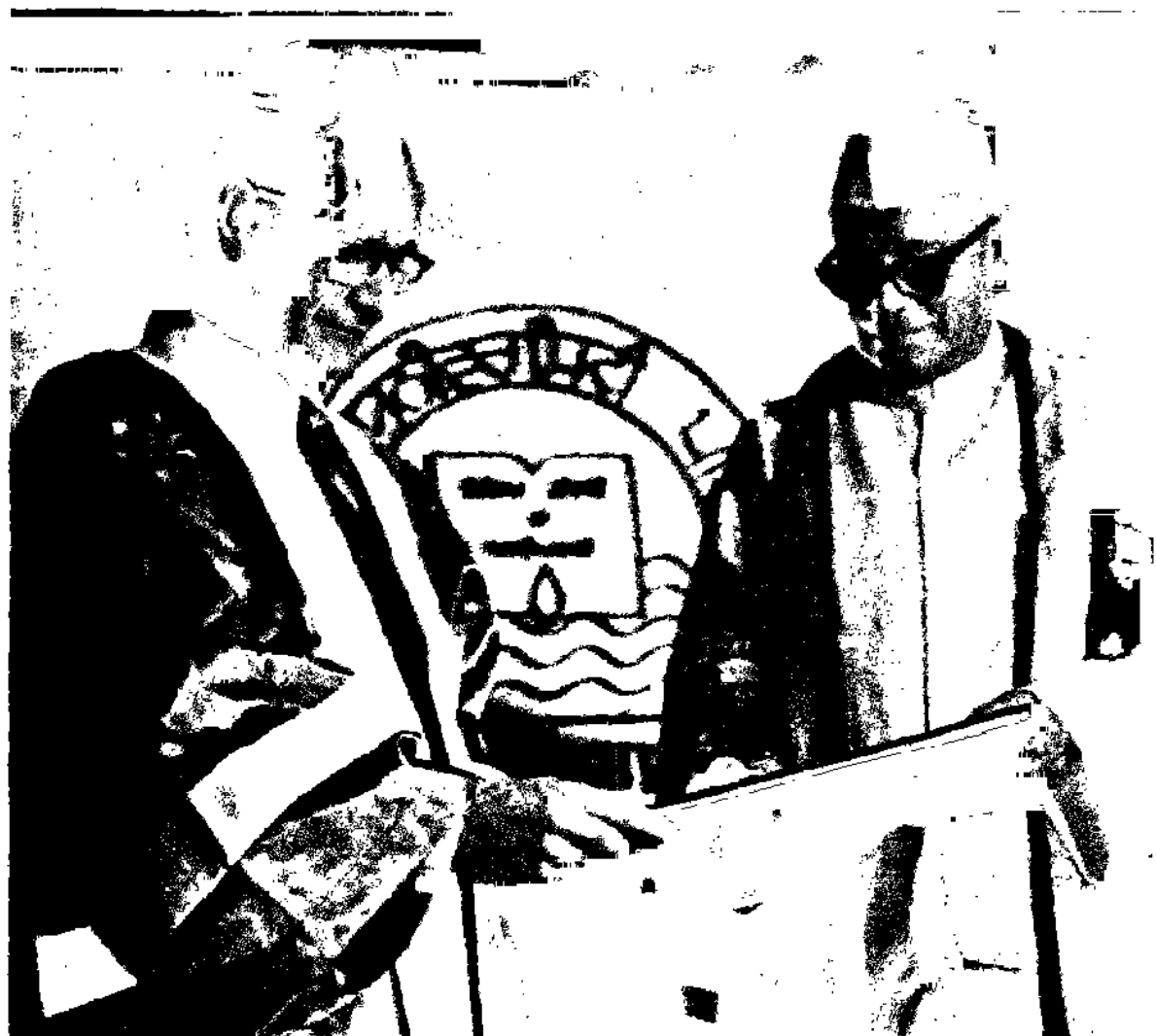
heritage, hospitality.

You'll discover Air-India speaks the same language as you do in the air and on ground. You'll get the sort of food, service, style to which you are accustomed. And you'll find that Air-India understands you like no other airline can.

Next time you fly, remember your country's airline. Air-India knows what it means to be an Indian, what it takes to make an Indian smile.

• Be an Air-Indian. Fly Air-India.

Dr. Hargobind Khorana, Nobel Laureate, receiving the Honorary Degree of Doctor of Science conferred on him by the Punjabi University (Patiala) from the Punjab Governor, Mr. M. M. Chaudhury at a function held in New Delhi.



**WORK-ORIENTED
EDUCATION**

Classified Advertisements

SAMBALPUR UNIVERSITY JYOTI VIHAR, BURLA

Advertisement No 30212/TDS.

Dated. 12-10-74

WANTED

Name of the Post: Lecturer in Political Science (One Post).

Nature of the Post: Permanent.

Scale of pay: Rs. 400-40-800-50-950.

Essential Qualification

1. Atleast a Second Class Master's Degree in Political Science with 48% marks.

2. Teaching/Research experience will be regarded as an additional qualification.

Desirable Qualification

Specialisation in one or more of the following subjects:—

1. Advanced Political Theory.

2. Socialist Thought. 3. International Politics 4. Government and Politics in India.

The post carries usual dearness allowance as would be sanctioned by the University from time to time.

Seven copies of the application forms will be supplied from the University Office to each candidate in person on cash payment of Rs. 2/- (Rupees two) only. Candidates intending to receive forms by post are required to send (a) Crossed Postal Order of Rs. 2/- payable to the Finance Officer, Sambalpur University, Jyoti Vihar, Burla (b) a Self-addressed envelope (23 cm x 10 cm) with postage stamps worth Rs. 2/- affixed to it with the words 'APPLICATION FORM FOR TEACHING POSTS IN SAMBALPUR UNIVERSITY' superscribed on it. Money Order/Cheque will not be entertained.

The last date of receipt of applications in the office of the University at University Campus, Jyoti Vihar, Burla, Sambalpur (Orissa) is 15-11-74. The candidates will be required to appear for an interview before a Selection Committee at their own expenses.

All Communications should be addressed to the Registrar by designation only.

Sd./- B. Misra

REGISTRAR

INDIAN INSTITUTE OF TECHNOLOGY KANPUR, IIT POST OFFICE, KANPUR

Advertisement No. 23/74:

APPLICATIONS are invited for the following posts in the Computer Centre of the Indian Institute of Technology, Kanpur.

1. Associate Programmers:

Pay scale of: Rs. 375-15-650.

Qualifications and Experience:

A first class or high second class Bachelor's or Master's degree in Mathematics, Statistics, or Physics, or Engineering. Atleast two years of programming experience in FORTRAN and Assembly language. Selected candidates will be expected to develop and maintain programme, act as consultants and operate computers.

2. Systems Programmers:

Pay Scale of: Rs. 400-40-800-50-950.

Qualifications and Experience:

A first class or high second class Master's degree in mathematics, Statistics, or Physics, or Bachelor's degree in Engineering. Five years experience in Assembly language programming. Experience in design of system software. Selected candidates will be expected to develop and maintain system software, act as consultants and operate computers.

3. Computer Maintenance Engineer:

Pay scale of: Rs. 400-40-800-50-950.

Qualifications and Experience:

A first class or high second class Bachelor's degree in Electrical Engineering (with emphasis on electronics and computers). Experience in programming and design of digital electronic circuits. The selected candidates will be expected to maintain the PDP-1 computer, and interface between different computers, perform logic design, and undertake development and fabrication of various subsystems in a computer.

4. Senior Systems Programmers:

Pay scale of: Rs. 700-50-1250.

Qualifications and Experience:

A first class or high second class Master's degree in Computer Science, mathematics, statistics, physics or engineering and at least 10 years of systems programming experience, or a Ph.D. in above subjects with three years of systems-programming experience. The candidate must have experience in design of computer languages, operating systems, and other system software.

Selected candidates will be expected to design various types of system software, and initiate and coordinate systems-programming activities.

A total of six posts are available in Computer Centre and one post in Academic Section. Depending upon the qualifications and experience, candidates will be considered for any of the above posts. Two posts are reserved for candidates belonging to scheduled caste/scheduled tribes. However, if no suitable candidate belonging to SC/ST is available positions will be filled up by other candidates.

The age of retirement is 60 years. Besides pay, posts carry allowances according to the institute Rules, which at present correspond to those admissible to Central Government employees stationed at Kanpur. Higher initial pay is admissible to specially qualified and deserving candidates. The scales of pay given above are subject to revision as per Third Pay Commission recommendations as approved by Government. The selection committee may relax any of the above requirements for the posts in exceptional cases.

All posts are permanent and carry retirement benefits in the shape of CPF-cum-Gratuity Scheme or G.P.F-cum-Pension-cum-Gratuity Scheme.

Applications should be made on prescribed forms obtainable free of charge from the Registrar of the Institute by sending a self addressed unstamped envelope of 25 cm. x 10 cm. size. Names of three persons who are fully acquainted with the professional experience and character and nature of the applicant may be given so that a reference could be made. Applications accompanied by a Postal Order for Rs. 7.50 (Rs. 1.87 for SC/ST candidates) should reach, Registrar, Indian Institute of Technology Kanpur, IIT Post Office Kanpur-208016 not later than 30-11-1974.

UNIVERSITY NEWS

Vol. XII
No. 11



NOVEMBER
1974

A Monthly Chronicle of Higher Education

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Opinions expressed in the articles and reviews are individual and do not necessarily reflect the policies of the Association.

Editor : ANJNI KUMAR

Academic Indiscipline

THERE is a general feeling everywhere that there is crisis in Education and the products of the system are becoming more and more indisciplined, vulgar, and even violent, at times. If this is true, it may be regarded as a Post-World War phenomenon. Alongwith the teen-agers there is also increase in the number of teacher-politicians and increasing evidence of lack of proper educational planning. The College or the University ceases to be the spearhead of creative activity for those for whom it is meant. The decadence of the value system and the war between the generations might be attributed as the reasons for the purpose.

The basic purpose of every educational institution is to promote dissemination of knowledge. A system which does not bring the teachers and the taught together for joint academic venture can hardly be called a worthwhile programme. A College is said to be an educational institution with the central purpose of creating social mobility. At one time, it was remarked, there could be no knowledge without a College. If there is intergenerational confrontation then the basic purpose of the institution in imparting appropriate instruction suffers. The confrontation between the teachers and the students can be described as a confrontation between those who are mature and those who are yet to be so. Such a confrontation at the level of higher education depends obviously on the age, social and family background of the parties concerned. It may also be attributed to inadequate schooling and disproportionate growth of personality. Consequently, the usual solution lies in fixation of minimum age limit for admission to the educational institutions concerned. Education may be free, either at the primary level or at the level of higher education. But those who deserve should get it since the human potentialities are not developed uniformly in all cases.

Curricular intensification also appears to be necessary for providing adequate engagement to the participants. Teachers in many cases are either scholars or do not know their responsibilities, or pseudo-Scholars, or teacher-politicians. Scholars now are likely to have much less interest and attachment in their students than did their counterparts even a decade ago. Some scholar-teachers know how to do their job well. The teacher-politicians are foreign to the arena of knowledge. A true teacher knows that he is performing a missionary function in educating the children of others. But if the children of others refuse to be educated, the scholar-teacher is bound to be a silent spectator of the academic revolution. The teacher-politician appears to be concerned with non-academic matters, may be of the academic community. Those who are actually interested in the welfare of the young face opposition in translating their ideas into practice, from the educational administrators. This occurs due to the existence of collective regulations for guiding academic behaviour. Academic regulation is no more the business and concern of individual teachers. It has become the function of those who might not have passed through the complete process of academic administration and regulation. A dead or mechanical soulless institutional framework cannot respond to the requirements of the circumstances. Those who know their job well can alone bell the cat. It is often easy to make general statements about the operation of a pattern of institutional arrangement. Bureaucratic procedures or political solutions work like round pegs in square holes. The wearer alone knows where the shoe pinches.

(Continued on page 8)

Work-Oriented Education : An Approach

There is constant need to change the curriculum not only at the school level but also at the post-secondary level. An important departure must be made to introduce work-oriented education at the under-graduate level.

P.L. MALHOTRA

IF education is the result of experience whereby we become more or less able to adjust ourselves to the demands of a particular form of society in which we live and work, then it becomes important, in the present context, that the post-secondary education should be related to the rapidly changing modern Indian environments.

An important departure should be to introduce work-oriented education at the under-graduate level. Courses whether leading to diploma, certificate, or a degree should be vocationalised. It is, therefore, desirable to introduce some such subjects whether knowledge based or laboratory based, as part of the under-graduate studies, which should prepare students for middle level occupation.

Aims and Objectives

- (1) To successfully inter-weave general and work-oriented education;
- (2) To diversify education with a view to provide not only knowledge but also some skill;
- (3) To give sufficient orientation which may lead to gainful employment in middle-level occupation;
- (4) To introduce the study of unconventional yet academic subjects as part of the college education and release education from the strangle hold of the tradition ridden-system.
- (5) To relate class room experience with practical work experience;
- (6) To involve trained professionals in various

trades to help prepare and design courses; to provide instruction and training so that students are exposed to the real needs of industry, agriculture, commerce and trade.

- (7) And that the study be largely region based and related to the manpower needs.

At present B.A./B.Sc. (Pass Courses) studies have a single track system, leading to an all purpose degree, without employment relevance. To begin with, the objective will be achieved through the introduction of some vocational subjects along with the existing subjects. For the immediate, drastic changes in the present pattern need not be introduced, nor should we add purely professional courses.

Introductory Vocational Subjects

A student might opt for any vocational (knowledge based) course after Higher Secondary. An illustrative list of some such subjects, which could be included as introductory vocational options as part of the B.A./B.Sc., is given below:

1. Tourism
2. Office Management and Stores Accounting
3. Store-keeping and Stores Accounting
4. Insurance
5. Retailing and Trade
6. Book Publishing
7. Foreign Trade
8. Child Care Services and Pre-school Training
9. Hotel Management and Food Services
10. Textile and Clothing Work
11. Polymer Technology

The author is Principal, College of Vocational Studies, University of Delhi.

12. Instrument Technology
13. Computer Science
14. Electronics
15. Pharmacy
16. Microbiology
17. Library Science
18. Television Technology.¹

Rationale for Selecting Subjects

In the context of Delhi region the introductory vocational subjects mentioned above have been selected after careful scrutiny and thorough discussions with persons in the trade and other employment agencies. In trying to find employment demands, which remain unfulfilled, in the metropolitan region, expertise in the Institute of Applied Manpower Research, Ministry of Labour and Employment, Ministry of Education, and number of other trading agencies and associations has proved extremely helpful.

Though it is difficult to state with certainty the exact demand potentials of a particular vocation, but with the help of employment agencies and employment exchanges, a qualitative estimate can be formed, if not quantitative. In fact the areas located are those where normally an ordinary graduate (Arts, Science or Commerce) seeks employment. As the effort of the programme is to induce practical motivation and thereby make him more employable, this will in some way relate his education to productivity.

The course contents of all the above mentioned subjects have already been prepared. To tailor the course content for this academic endeavour, expertise from outside the Universities must and should be freely utilised. After all it is the requirement of prospective employer which should be kept in view. It is my personal experience that the private and public agencies are extremely keen to help the university in designing the courses and are willing to come forward to provide temporary and part-time faculty to impart instructions in vocational subjects. For example, a course for a new option, Tourism both at the under-graduate and post-graduate level has been designed by experts in the Department of Tourism and Tourism Industry. Similarly, courses on Book Publishing have been prepared by experts.

Subject Combination

Of the subjects mentioned, students should have the choice to offer one for the B.Sc. degree as an elective subject and one or a maximum of two for the B.A. degree. The general pattern of the present B.A./B.Sc., may however, remain unchanged. For most of the first year students should study general subjects and part of the second and most of the third year should be devoted to the study of vocational subjects. Long vacations should be used for giving

practical training in their respective fields and also for organising workshops. For the students of our college many private and public trading agencies have provided necessary facilities for training at their establishments.² Many have given scholarships and internship.

Under the proposal a student can take one or two introductory vocational subjects as an elective combination. Instead of taking a traditional combination of elective subjects like History and Political Science, he could opt for History and Tourism and yet another vocational course, if he wishes. The University should not offer any special degree but should introduce various options as an integral part of the B.A. and B.Sc. degree.

This is as far as the first phase of the programme is concerned. Once the scheme is accepted and the employability of the courses tested, it might be advisable to convert the study of such courses into diploma courses. These courses may preferably be run in the evenings so that the college buildings could be used more intensively. The advantage is obvious.

For example if a student wants to learn about introductory vocational courses on retailing and trade and sales procedures, he need not follow a three-year B.A. degree course. Diploma course of one to two years duration in vocational subjects should be started in every university on experimental basis.

In the second phase it will be appropriate that indepth study and training in certain vocational courses which are really non-traditional and knowledge based, like Tourism, Book Publishing, Advertising etc. be introduced either as quality type undergraduate courses or as post-graduate diplomas.

Infrastructure

With the objects in view, every university should in the first instance set up a new Institute or a College.³ The College should have a Director/Principal and such members of the teaching staff who would teach basic and general subjects. Where necessary staff is not readily available in the university or where supplementary teaching and other resources are found wanting, there need be no hesitation in inviting the cooperation of agencies outside the university, who

1. See Brochure and Bulletin of Information of the College of Vocational Studies, University of Delhi. This Institute was started in the year 1972 (Golden Jubilee year of the Delhi University).

2. It may be too early to say any thing definite about the success of the programme because the first batch of students from this college will pass out in 1975. But in the light of our past experience we have already revised many courses and re-scheduled the vocational programmes. Some of the new courses, quality type and post-graduate diploma will be introduced from 1975.

3. In order to propagate the idea to provide new degree courses with distinct vocational bias, paying special attention to the employability, Delhi University started the College of Vocational Studies in 1972. This is the first university which has attempted to break new grounds by establishing this Institute which represents the first serious attempt by a traditional Indian university to vocationalise college education. Subsequently, Bangalore University and a few others have also introduced vocational courses.

should be willing to help in organising and running these courses.

Therefore, for imparting instruction in introductory vocationally biased subjects, permanent staff should not be recruited because there is likelihood that some courses may lose their utility after some time, so flexibility is needed. Further, by inviting persons from trade and industry and other appropriate agencies, a new relationship between students and society will emerge, which will to some extent help in bringing about the desired social change.

Most of the teachers who should be involved for imparting instruction in vocational courses, must be drawn from trade and industry. This procedure will expose students to the real needs of industry and trade. Another advantage of such an association will be that students will be absorbed by employers for training and subsequently for full employment.

Every university must start a new centre or college which develops into a nucleus of work-oriented education. Only by this way it will be possible to assemble a group of teachers dedicated to the new mode of education, new aims and objectives, new content of courses and new teaching methods. Such an experimental institute would have to perform the following functions:

- a. Teaching and training in vocational/work-oriented subjects;
- b. Designing and organising vocational courses;
- c. Evolving continuously the relevance and success of the courses and to study employment market.

After the experiment is successfully launched at one institution most of the under-graduate courses should then be transferred to other constituent colleges. In fact the existing facilities of laboratories, workshops in colleges and universities should be used. Coordination, evaluation, vocational guidance, post-graduate courses, research in curriculum development and procedure of implementation could be under the general supervision of one Central Institute. As far as the functioning of under-graduate diploma, certificate or degree courses in different institutions, the central set up will only assist and not interfere.

It will be appropriate that the courses of study whether laboratory based or non-laboratory based, skill based or knowledge based should be selected in such a way as to suit basically the regional requirements.

No body will deny that education is an instrument of social and economic change and perhaps the present day traditional courses, particularly in social and applied sciences also need to be supplemented with the study of the problems of the community, in developing societies. Therefore, there is a constant need to change the curriculum not only at the school level but also at the post-secondary level. Traditional higher education and research has to be restricted. And greater part of what is presently called under-graduate studies should be vocationalised. □

Remote Sensing Technology promises a method of identifying our natural, renewable resources and for monitoring 'pollution' on a global basis.

Remote Sensing Technology for Resources Survey

P.R. PISHAROTY

THE ancient Indians had a concept of remote sensing. For example, in the epic of Mahabharata, Sanjaya was temporarily endowed with a mystic power.

*"Chakshusha Sanjaya rajan
divyena samanyutah
Kathayishayati te yudham,
sarvajnasya bhavishyathi
Prakasam va aprakasam va divi va
Yadi va nisi, sarvam vetsyati Sanjaya"*

"Oh King, Sanjaya bestowed with divine eyes will tell you everything about the war; open or camouflaged, whether by day or by night, Sanjaya will know everything."

It is well known that there exist now-a-days reconnaissance satellites to do what Sanjaya is supposed to have done. The purpose of this article is to 'demystify' the technology of remote sensing and to outline how it can be used for the economic benefit of our nation.

The growth of interest in remote sensing tech-

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nology has been primarily due to a realisation that man's resources are limited to those now available on the planet earth and that his survival will depend upon the identification and a wise use of these resources. An unplanned and excessive use of such resources has also led to the so-called depletion and pollution of the human environment. Remote sensing technology promises a method of identifying our natural and renewable resources and for monitoring the 'pollution' on a global basis.

Remote sensing is detecting the nature of an object or of a phenomenon without actually being in contact with it. Since the beginning of civilisation, man has used his eye as a powerful instrument for remote sensing. For nearly a century, the photographic camera in conjunction with the usual photographic plates and films has supplemented the visual observations. It is well known that the human eye (and the common photographic film) is sensitive to only a small part of the electromagnetic spectrum. The visual range extends from a wavelength of about 0.4 microns to a wavelength of about 0.7 microns (a millionth of a metre is called a micron).

The recent developments in remote sensing technology uses the radiations over a wide range: from an ultraviolet wavelength of 0.3 microns to an infrared wavelength of 12 microns and also radio waves ranging from wavelengths of a few millimetres to a few centimetres.

Infrared Heat Radiation

"The human skin, particularly on the face, is sensitive to infrared heat radiation. A black steam locomotive standing at a railway station emits a lot of infrared radiation and a blind man approaching such a locomotive can easily detect its presence through the warmth radiated by it. A rat snake has two spots on its head very sensitive to infrared radiation in the 10-12 micron band. A frog being warmer than the surrounding grass or earth, emits more radiation and the snake detects it through its sensors. It will have enough 'signature' information to distinguish a frog from the foot of a horse."

There are modern infrared detectors which are far more sensitive than the snake's spots. Carried on aircraft or spacecraft they can scan the earth's surface and detect small differences in temperature on the ocean surface as well as on land, by night or by day. Valuable inferences can be drawn from such differences in temperature. A warm patch of coastal sea-water would indicate discharge of hot water from a power plant. Cool patches of coastal sea-water may indicate seepage of cool underground water into the sea. At night, on land, buildings and tarred roads remain warm compared to lawns and gardens and these can be discriminated in an imagery obtained in the infrared.

There are special colour films which are sensitive to near-infrared radiations of wavelengths 0.7—0.9 micron. In such films, ordinary green is recorded as blue and near-infrared light as red. Healthy

plants are green to the human eye. The structure of chlorophyll-containing cells is such that it scatters abundant radiation in the near-infrared. So, when healthy green vegetation is photographed in sunlight with such a colour film, the vegetation will appear red; if there are any green painted canvas tents among the vegetation the tents will appear as blue on a red background. The film portrays the scene in false colour; the film can be used for camouflage detection. Hence such films are called 'camouflage films' or 'false colour' infrared films. These films have a use in agriculture. A deficiency of chlorophyll can be detected. Such deficiencies indicate a lack of vigour of the plants and this may be due to lack of water, lack of appropriate fertilisers, lack of trace minerals or due to disease or insect infestation.

Components of the Technology

The technology of remote sensing consists of: Sensors to detect the invisible (as well as visible) radiations emitted by the objects and phenomena on the earth's surface and to record them either as imagery or as electric signals on magnetic tapes.

Laboratory and field experiments to relate such imagery or data on magnetic tapes to the characteristics of the objects on the earth's surface. This involves the collection of the 'signatures' of the terrestrial objects in terms of the imagery or other data collected by the sensors. In other words, these experiments determine the 'ground truths'.

Manual or electronic processing of the data collected by the sensors so as to derive information about the terrestrial objects. This would involve the use of the characteristic spectral signatures of the terrestrial objects in the invisible and visible parts of the electromagnetic spectrum.

Needless to say that the technology also involves the use of aircraft and spacecraft platforms for mounting the sensors. Obviously, in the case of spacecraft platforms there should be suitable methods of transmitting the data to a ground station in the form of signals—more or less as in the broadcasting of television programmes. This involves considerable use of electronic communication.

Specific Uses

Some of the specific uses to which the technology of remote sensing can be put to, are indicated below:

Agriculture and Forestry: Plant diseases and insect infestation; crop and tree inventories; soil moisture content; forest fire detection; study of arable and non-arable lands; assessment of crop vigour for forecasting crop yields; study and classification of soil types.

Hydrology: Measurement of snow cover, ice accumulation and their changes; surface water inventories; flood control and water management; seepage

of underground water into river, streams and coastal sea-water; location of water wasting weeds.

Oceanography: Wave-heights and thence winds; surface temperatures and thence location of schools of fish, estimation of ocean currents, forecasts of cyclone development; water colour tones and thence coastal water topography, water pollution, estimation of plankton; oils slicks of petroleum origin or of fish origin.

Geology: Outcrops of rocks and mineral mapping; faultlines, lineaments and plate tectonics; detection of structural features associated with hidden mineral deposits; soil and rock types favourable for the existence of hidden minerals, detection of vegetation affected by mineral contents of the soil; geothermal mapping; detection of gases associated with minerals below.

Cartography and Geography: Topographic mapping; study of urban areas and areas of recent townships; mapping of rivers, lakes, etc.; delineation of wet lands.

Environmental Control: Monitoring of atmospheric and sea pollution; study of aquatic and terrestrial eco-systems.

Work at S.A.C.

A few coconut plantations in Kerala were photographed in 1970 from a helicopter platform using a Hasselblad camera and false-colour infrared films. The experiment proved the feasibility of detecting the wilt (root) disease of coconut trees, even before the disease was visually apparent. The infrared reflectance from the crowns of the infected trees was considerably less than the reflectance from the crown of healthy trees. The infection was later confirmed by a test for the virus. The presence of the corresponding virus was revealed through an electron-microscopic examination of the leaf extract from those trees. The project was not pursued further, as a proper cure for the disease was still under investigation.

An infrared scanner for sensing radiances in the 10-12 micron band has been built at the Centre. A few trial runs using the scanner from an aircraft platform have shown that spatial variations of one or two degrees centigrade in the ocean surface and land surface temperatures can be discriminated. Lack of accurate navigational systems have been a great handicap; the areas to which the radiances recorded refer, could not be pin-pointed.

In November 1972, April 1973, December 1973 and May 1974, remote sensing of agriculture and landscape features from aircraft platforms were carried out at sites in Poona, Bombay, Sriharikota island, Bangalore, Jaipur and Ahmedabad. Hasselblad cameras with different types of films and filter combinations were used.

The false-colour aero films gave considerable amount of information. Wet lands, bare lands, roads, water, streams and different types of crops like jowar, sugarcane, onion, wheat, etc., could be discriminated. Rice crop having an insect stress could be distinguished from a healthy crop; similarly

infected citrus trees could be distinguished from healthy ones. The stressed vegetation scattered less infrared radiances.

The principal objective of the Remote Sensing Division of the Space Applications Centre, ISRO, is to evolve a multi-disciplinary technology for providing a quick inventory of the country's resources, particularly in agriculture, every year. Using remote sensing technology, it may be possible to foreshadow by the end of August each year, the total amount of food grains likely to be available for the people of India from the monsoon crop of that year. Such data, when available, would enable the Government of India to take the necessary administrative and technical steps on the food front by the end of September.

The future plans of SAC in the field of Remote Sensing will be oriented towards the objective mentioned above. We have to build scanners, develop logistics and surveying skills, build adequate data banks of spectral signatures for the terrestrial features of economic importance, carry out surveys and process voluminous data employing manual, optical and computer techniques. The above work will have to be oriented first on the basis of using aircraft platforms and later on the basis of using spacecraft platforms. It is obvious that the plans will have to be tailored to availability of funds. It can also be that the availability of funds will depend upon the economic benefits which can be derived within reasonable time limits from remote sensing technological skills which can be generated within the country.

This technology is new and hence India is almost on the same 'ground floor' as some of the advanced countries. We can, therefore, hope that adequate technological skills will be developed locally, so that we will be able to use this powerful and sophisticated technology to the same extent as any advanced country, for the economic and social betterment of our people. □

Academic Indiscipline

(Continued from page 3)

It is high time in India to develop the educational institution as the centre of intellectual exchange and participation. India is that country where Gurukul system had been in vogue. Education is a human activity. We are not in a factory or an office or an impersonal organization for that purpose. Participation is purely a voluntary act. Dialogue is not automatic. The crisis can be averted if there is a deeper involvement, greater attachment and voluntary participation. The builders of tomorrow can not be allowed to go astray, without following a code of academic conduct in their own interest for attaining perfect fulfilment and manhood. Still there is time. There is neither any cause for pessimism nor for alarm. But the solution lies in pursuing sincerely a programme of co-ordinated and co-operative action in the appropriate direction.

—Bhaskar Chandra Das

The ideals and objectives of a library are reflected in its collection, staff-pattern and modus-operandi. A preview of the J. N. University, thus, is apposite to a correct perusal of what is called its 'nerve centre', the library.

J.N.U. Library completes 5 years

A. R. Sethi

JAWAHARLAL Nehru University appeared on the scene as a Central University in 1966 for the purpose of promoting the "Study of the principles for which Jawaharlal Nehru worked during his lifetime, namely, national integration, social justice, secularism, democratic way of life, international understanding and scientific approach to the problems of society."

The basic units of the University are not single disciplines, but multi-disciplinary Schools of Studies. A school is made of several Centres and Divisions, where the scholars, irrespective of their disciplines, are engaged at a particular time in a specific study or project; or, where

Vigyan Bhavan Annexe, New Delhi. (The regular post of librarian was filled in 1972). It moved to a big hall in the present University premises at New Mehrauli Road in January 1972, from where it shifted again in September the same year to the presently occupied 5-storeyed building. It will eventually be accommodated in a spacious building being planned for it in the University's own campus.

Collection

The library acquired the first lot of books in March 1970. Since then the collection has been growing at a fast pace. (See table below).

Category of	Accessioned Volumes as on 31st March				
	1970	1971	1972	1973	1974
Reading Material					
Books	2400	10,073	24,793	46,464	72,920
Bound Periodicals	Nil	Nil	1,479	5,901	8,306
Microfilms/ Microfiche	Nil	Nil	78	641	929
Maps	900	1,500	2,701	2,915	2,919

scholars trained in the same disciplines are concerned with the use of particular discipline in other fields. The emphasis, thus, in this University is on inter-disciplinary research and studies mainly at the post-graduate level. It is a 'national' University in the real sense of the term in that seats are reserved for candidates from each State in India.

It is the requirements of this type of educational philosophy and clientele that the JNU Library has to cater to.

The library started its operations in 1969 under the headship of an Officer on Special Duty at the The collection of J.N.U. Library got enriched

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with the merger of the prize collections of School of International Studies (total 76331) and Centre of Russian Studies (total 16679) (formerly Institute of International Studies, and Institute of Russian Studies respectively, both autonomous institutions), with its own material. The valuable collections, donated by British Council, Canadian and Australian High Commissions, Penguin Books, Prof. Gian Chand, Kingsley Martin and the one purchased belonging to late Prof. D.D. Kosambi, have given a further fillip to its collection.

The library is on the free mailing list of such international agencies as OECD, GATT, FAO, ILO, WHO and IBRD. Besides, it also receives unpriced publications of the Government of India, State

Governments and the Government of Australia. It has also exchange arrangements with, besides several other institutions, the Akademia Nauk (USSR) and National Library of Peking.

Current Periodicals

During the year 1973, the Library subscribed to over 2500 periodicals, and over 500 periodicals were received on gift/exchange basis. Of these, 1700 belonged to Social Sciences, 200 to Literature and Linguistics, and the rest 500 to Life and Natural Sciences. Subsequent to an arrangement with the Social Sciences Documentation Centre of the Indian Council of Social Sciences Research, under which this institution agreed to subscribe to periodicals falling in the domain of Social Sciences and display and service such periodicals in JNU premises, the JNU Library stopped subscribing to such journals. During the year 1974, the SSDC took out subscription of over 2000 periodicals. The National Science Library is also located in the JNU campus, so that its enormous collection of Science books and periodical is accessible to JNU research scholars and students.

Classification and Cataloguing

JNU Library is perhaps the only University library in the world to practise two most scientific schemes of classification—Colon Classification (7th Edition) and Universal Decimal Classification (UDC)—side by side, the former for social sciences and humanities material, and the latter for science documents. The Classified Catalogue Code, with certain alterations, is used for cataloguing purposes, and the Unit Card System is followed for preparation of catalogue cards.

The Catalogue is divided in three parts: Classified Part, Alphabetical Part, and the Subject Index. A separate Regional Catalogue is being maintained for bringing all cards relating to an area at one place.

Documentation Services

Few University libraries in India can claim of providing such systematic and timely bibliographical services to their readers as the JNU does. Indexing of over 1000 periodicals in social sciences and humanities and 300 periodicals in Sciences, yielding more than 20,000 entries, is undertaken during a year. The information of the articles is transmitted to the readers through (i) 'ARTICLES OF THE WEEK' list, (ii) Selective Dissemination of Information (SDI) Service, based on Readers' Profiles, and (iii) Subject bibliographies prepared from time to time. Preparation of 'India and the World Affairs: A Bibliography', and a bibliography on a current topic in International Politics are among the annual routines of the Documentation Section.

Organisation

1. Building and Stack Area: The library is located in a 5-storeyed building with a stack area of 10500 square feet. As this structure was not planned for

a University Library, it is already showing signs of over-capacity, and several bottlenecks are coming up in the way of accommodating the readers and the reading material under the same roof. While the books and the bound volumes of periodicals are located in the main building, the current periodicals, maps, newspapers and newspaper clippings have had to be shifted to separate points.

2. Access to material: There is 'open access' to all the reading material available in the library, except for rare-books, dissertations and microfilms/microfische.

3. Reference and Text-book Collections: The library has a comparatively moderate collection, numbering about 5000, of reference-books consisting of bibliographies, encyclopedias, dictionaries, atlases, almanacs, year-books etc. However, the lacuna of small collection is more than compensated by a personal and individual attention given to each reader in the library.

The text-book collection comprises of course-books and such other books as are frequently in demand. Books are issued for consultation against readers' tickets and loaned for outside use only on an overnight basis (for seven days when there are multiple copies of the text-book).

4. Circulation: The number of tickets issued to various categories of readers is as follows:

Teachers	12	Non teaching Staff:	
Research Scholars	6	Administrative	6
Students	4	Non-administrative	2

The loan period for general books is 15 days. However, the needy students also get books for the Semester period.

Browne System is followed for charging purposes with the modification that an extra author-dummy card is prepared, which is filed separately in the alphabetical order. This facilitates answering instantaneously the query if a particular book is issued at a given time.

5. Special facilities for the readers: The library has a well organised system for inter-library-loan. Any book/periodical anywhere in Delhi can be procured on inter-library-loan, or arrangements are made for the reader to go himself/herself to the place, in case the material belongs to 'Not-For-Issue' category. For those readers who can type themselves, five type-writing machines have been made available in the stack area for taking notes. Xerox facilities can be availed of at very very moderate charges. Three microfilm-readers and one microfiche reader, located in a dark-room, are at the disposal of the readers. Members can bring their personal reading material inside the library and keep the same in the lockers allotted to them. Separate tables are similarly allotted to each research scholar. For relaxation purposes, the canteen and smoke room conveniences have been provided within the library precincts itself.

6. Staff: At the foundation of this systematic organisation is the library staff, which is not only

young and energetic (the age-range is 20-40, excluding the Librarian), but also highly qualified, both academically and professionally.

Future Projections of the Library

With the shadows of financial stringencies looming large over the horizons of education, and libraries being subjected to all sorts of cuts, it has become a little risky to project their future plans. Still no organisation can proceed further without plans. The J.N.U. Library has a plan for the years 1974-75 to 1978-79. Its salient features are:

1. The University is expected to have 3200 students and 400 teachers in its 7 Schools by the end of 1978-79. The character of the library will be largely determined by their requirements, supplemented by the demands of Scholars of other Universities and research institutions of India.

2. Apart from acquiring research materials through purchase, special efforts will be made to acquire publications through gift and exchange arrangements. The target is to acquire at least 50% of publications in this manner. At least 1000 arrangements for the exchange of periodical publications are proposed to be worked out upto 1978-79.

3. Documentation Services will be a special feature of the University Library. The press clipping service will be organised to comprehend significant items of news, articles and editorials from Indian and foreign newspapers. A card index of 30,000 articles per year will be cumulated and published on a regular basis. Special attention will henceforward be devoted to the work on retrospective bibliographies on India in areas of special interest to our University Scholars.

4. **Reprography Facilities:** It is proposed to set up a large reprography unit in co-operation with the Indian Council of Social Sciences Research. The reprographic equipment including Xerography machines, microfilm readers and microfilm cameras are proposed to be acquired under this scheme. ☐

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The Myth of Population Control

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Development plan of Mithila University

THERE had been persistent demand for the establishment of the Mithila University at Darbhanga, since 1947. The State Government, by an Ordinance called 'Mithila University Ordinance, 1972', decided to establish this University at Darbhanga; and the Ordinance came into force with effect from the 5th August, 1972.

Prior to the establishment of the Mithila University, there was only one University, namely, University of Bihar, with its headquarters at Mazaffarpur, for the most densely populated areas of north Bihar.

The jurisdiction of the Mithila University extends over six districts of north Bihar, namely, Darbhanga, Madhubani, Samastipur, Saharsa, Purnea and Kathiari, with a total area of 9689 sq. miles and a population of 1.20 crores.

Prior to the establishment of the Mithila University, the first three districts were under the jurisdiction of the University of Bihar, Mazaffarpur and the remaining three districts were under the jurisdiction of the Bhagalpur University. The Mithila University has, in all, 54 colleges.

The University imparts higher education in six faculties, i.e., Arts, Science, Commerce, Law, Medicine and Teachers' Education. There are about 50 to 55 thousand students enrolled in different colleges under the jurisdiction of this University.

Post-Graduate Teachings in seven subjects, viz., Hindi, Maithili, English, Economics, Political Science, Commerce and Mathematics, were started at the C.M. College centre, Darbhanga, by the University of Bihar. None of these P.G. Departments was headed by a teacher of the rank of the University Professor. Each department is headed by a teacher in the rank of a Reader. After the establishment of the Mithila University, the Post-Graduate Departments have been separated from the C.M. College and they are now directly under the administrative control and management of the University. Recently, the State Education Department has sanctioned the creation of one University Professor for each of the seven Post-Graduate Departments mentioned above.

Office Accommodation

The University Office is, at present, located at a distance of about 5 km. from the urban area of Dar-

bhanga and it is housed in a small building, which is at the disposal of the State Government. The selection of site for the campus of the University has been finalized and steps are being taken to acquire the land and buildings.

Development Schemes of the University

The salient features of the schemes for the development of this University, during the fifth Five-Year Plan, are:

The U.G.C. sanctioned a number of schemes for the constituent and affiliated Colleges of the University at a total estimated cost of about 50 lakhs, the U.G.C. share being about 28 lakhs. But a sum of Rs. 8,55,000 only, could be made available during the Fourth Five-Year Plan from the U.G.C., and, consequently, most of the schemes could not be completed. The estimates of these schemes will have to be revised and re-sanctioned by the U.G.C. and the work completed during the Fifth Five-Year Plan.

University Campus

As stated above, the University does not have its own campus. It is proposed to develop the campus of the University, at an estimated cost of Rs. 1,12,00,000 during the Fifth Five-Year Plan.

Post-Graduate Teaching and Research: Development of Post-Graduate Teachings and Research will form the major part of development programmes during the Fifth Five-Year Plan. It will spread into three parts: (a) Strengthening of the existing seven Post-Graduate Departments; (b) Opening of new Post-Graduate Departments; and (c) Development of Research Activities.

(a) The existing seven Post-Graduate Departments (Hindi, Maithili, English, Economics, Political Science, Mathematics and Commerce) have, at present, no separate buildings. They are run in the morning shifts in the building of the C.M. College, Darbhanga. It is proposed to have seven Teaching Blocks for the P.G. Departments.

At present, there are teachings and research only in three Languages, i.e., Hindi, Maithili and English.

Besides teachings and research in three above languages, the scheme envisages Post-Graduate teachings and research in north-eastern Indian Languages, such as, Bengali, Oriya, Assamese, Nepali, Bhojpuri, Magahi, Sanskrit and Urdu. These languages have been influenced by one another and there is sufficient scope for research and higher studies. Besides, it is proposed to introduce one-year Diploma Course in two foreign languages, viz., German and French; and in one South Indian Language, i.e. Tamil.

(i) The Vidyapati Institute of Languages and Linguistics will undertake higher studies and research. It will have Language Laboratory. In the second phase, Diploma Courses in Chinese, Russian and Malayalam will also be introduced.

The envisaged development programmes have been drawn up, keeping in view the inter-linked relationship of north-eastern languages and the need of catering to the students of adjoining States and language areas. Diploma Courses in European Languages and South Indian Languages have been included in the programme in view of the opening of a wider vista in outlook. Besides, the study of South Indian Languages would help in national integration.

The Institute is proposed to be named after the great poet and savant of Mithila, i.e., Vidyapati Thakur. All the above departments within this Institute, would function more or less in independent manner, in day-to-day working, under the head of the respective departments, who will be of the rank of the University Professor. There would be, however, a central administrative set up for the co-ordination of all the inter-language subjects and to regulate the session policy and to control inter-departmental issues. The Institute, as a whole, would be headed by one of the heads of the departments, who may be designated as the Director. This headship may go, by rotation, for the tenure of two years. The head of the Institute would be concurrently head of his department and he may be paid an honorarium of Rs. 250/- per month, over and above his usual salary and allowances. There will be an Advisory Board, consisting of all the heads of the Language Departments.

Each Language Department will have a number of research scholars, to conduct researches in languages and linguistics. The pattern of teaching staff, for each department, would be: 1 University Professor, 2 to 3 Readers and 2 to 3 Lecturers, besides Scholars and supporting non-teaching staff.

The total non-recurring cost for the Vidyapati Institute of Languages and Linguistics, i.e., for building, furniture and equipments, has been estimated at Rs. 20 lakhs, to be shared by the U.G.C. and the State Government.

The recurring cost for the whole Fifth Plan period, on teaching and non-teaching staff, seminars and miscellaneous expenses, has been estimated at Rs. 51.45 lakhs.

Institute of Physical Sciences: The University

proposes to establish an Institute of Physical Sciences, comprising Physics, Chemistry, Mathematics and Statistics. The Institute will be accommodated in one teaching block, so that interdisciplinary teachings and research are also done and co-ordination in the various disciplines maintained. Post-Graduate teaching in Mathematics already exists.

The total cost for the construction of Teaching Block for the Institute of Physical Sciences, has been estimated at Rs. 25 lakhs, including Rs. 5 lakhs as the cost on furniture. The cost on equipments and chemicals, etc. for physics and Chemistry, has been estimated at Rs. 10 lacs.

The recurring cost over the teaching and non-teaching staff, seminar library and miscellaneous contingencies, has been estimated at Rs 31.38 lakhs.

The academic staff, in each department, would consist of 1 or 2 University Professor(s), 2 to 3 Readers, 3 to 4 Lecturers and 2 to 4 Research Scholars, besides supporting non-teaching staff, as Senior and Junior Technicians, Lab. Assistants, Store-Keepers, Lab. Bearers and ministerial staff. The Research Scholars would be registered for the Research Degrees and they would also be asked to take some classes, so that they may be trained for being a good teacher in the department. A number of research projects will be allotted to the Research Scholars, who will conduct researches under the supervision of senior teachers of the department.

Institute of Earth and Life Sciences: There will be a separate teaching and research Block for Earth and Life Sciences, such as, Geography, Geology, Botany and Zoology. These disciplines have many things in common and it will be in the fitness of things to have an independent Institute for these subjects, so that inter-disciplinary higher studies and research are done.

The total non-recurring cost on building and furniture for this Institute, has been estimated at Rs. 15 lakhs, besides the costs on the establishment of Botanical Garden and Animal House, at a total estimated cost of Rs. 2.5 lakhs.

The recurring cost on teaching and non-teaching staff, Seminar, Library and office contingencies, is estimated at Rs 45.54 lakhs.

The staffing pattern will be almost the same as indicated above, i.e., 1 to 2 University Professor (s), 2 to 3 Readers, 3 to 4 Lecturers, 2 to 3 Research Scholars and supporting non-teaching staff for each department.

For co-ordination and inter-disciplinary activities, the Institute will be on tenure basis by one of the University Heads.

Institute of Social Sciences: The scheme envisages a separate Institute for all the disciplines of Social Sciences, such as, Economics, Political Science, History, Sociology, Philosophy and Psychology.

At present, there are Post-Graduate Teachings in

only two of the above subjects, i.e., Economics and Political Science. These two departments will have to be strengthened with additional academic staff and equipments. Post-Graduate Teachings and Research in new department will be started as indicated below:

- (a) In 1974-75—History and Sociology,
- (b) In 1975-76—Philosophy; and
- (c) In 1976-77—Psychology.

The non-recurring cost for building and furniture for the Institute of Social Sciences, has been estimated at Rs. 15 lakhs and the recurring cost at Rs. 24.79 lakhs.

Institute of Business Management and Labour & Social Welfare: The Scheme envisages a separate Institute to be housed in a separate building. The proposal includes to strengthen the existing P.G. Department of Commerce and opening of new departments for Business Management and Labour & Social Welfare. The total non-recurring cost on building and furniture for this Institute, has been estimated at Rs. 15 lakhs, and recurring cost at Rs. 12.47 lakhs.

The staffing and administrative patterns will be the same as indicated above for other Institutes/Departments.

Institute of Law Education, Library Science and Journalism: At present, there is provision for teaching of Law at the Graduate level for LL.B. Degrees and Teaching of Education upto B.Ed. level. It is proposed to start teaching of Law and Education for Post-Graduate Degrees, i.e., Master of Law and Master of Education. Besides, Diploma Courses in Library Science and Journalism will also be started. The cost for the building and furniture for the above four courses, under this Institute, has been estimated at Rs. 15 lakhs.

Mithila Institute of Art & Culture: Mithila has been a seat of highly developed Art and Culture. The scheme proposes a study of and research on Mithila Society in its historical perspective, with special reference to Panji Systems and Caste Councils. A comparative study of regional culture will also be taken up.

Study in rites and rituals, including studies of village and family deities, collection and study of religious-cum-folk lore etc. in historical perspective, encouragement to and development of Mithila School of Music, i.e., (a) Margi and Deshi and (b) Musical Instruments used in Mithila, Mithila Paintings, including study of 'Alpanas' pertaining to different religious and social occasions, study of and research on Vedic and Tantrik Alphanas and study of wall paintings will be included in this scheme. Besides, the Institute will also conduct training and research in Mithila Art, such as, pottery, siki work, needle work, artistic handy work, etc.

Mithila School of Astrology—Investigation into Makaranda System of calculations and consequent revision of Mithila Panchang.

Thus, training and research in Mithila Folk Arts, Folklore and Folk Dance, particularly Vidyapati

Dance and Ballet will be conducted under this Institute. The Institute will also conduct studies and researches in Maithili customs, ceremonial costumes, utensils and earthenware, etc.

The Institute will be looked after by a Director, initially in the Reader's scale. He will be assisted by four Deputy Directors, who will be in the scale of Lecturer and each Deputy Director will be Incharge of one section, such as, (a) Study of and research on Mithila Society (b) Mithila Music, (c) Mithila Paintings and (d) Mithila Art, such as Pottery, Needle work and other artistic handiwork.

The total non-recurring cost for building and furniture has been estimated at Rs. 10 lakhs.

University Library

There is a proposal to have a Central University Library. The cost for the Library Building has been estimated at Rs. 25 lakhs, including Rs. 5 lakhs for furniture. Besides, it is proposed to purchase books and journals worth Rs. 25 lakhs and development of Book Bank for the poor and needy students, at an estimated cost of Rs. 3 lakhs. Thus, the total non-recurring cost on the Central University Library has been estimated at Rs. 53 lakhs and the entire cost is likely to be met by the U.G.C.

Development of Research Activities

The salient features of the programme, with estimated costs, are given below:

	Rs. lakhs
(1) Publication of research work/papers, monographs and manuscripts, etc.	2.5
(2) Fellowships for attending National and International Seminars	2.5
(3) Research Scholarships/Awards, etc.	2.5
(4) Utilization of the services of the retired teachers	1.5
Total	9.00

The entire cost is to be shared by the U.G.C.

Under-Graduate Colleges

The programme envisages extension of teaching accommodation for Science and Arts Colleges, extension of Science Laboratories, Library Buildings, establishment of Book Banks, etc., Students' Welfare Programmes and Teachers' Welfare Programmes, including creation of 35 higher posts for the constituent college i.e., the C.M. College, Darbhanga.

Three-Year Degree Courses

The new pattern of education, i.e., 10+2+3 has been accepted as the pattern of education to be introduced during the Fifth Five-Year Plan. This may necessitate appointments of additional teachers and strengthening of Science Laboratories. The scheme has been highlighted at a total estimated cost of Rs. 20 lakhs. □

Round Up

Rector sought for United Nation University

THE quest is now on for some one to fill one of the world's newest and most challenging academic jobs: Rector of the United Nations University which is due to begin work this autumn. Member States of the United Nations and Unesco, as well as other institutions, are being asked to submit names for the post.

A short list of three to five names is to be submitted by a nominating committee to the University Council before a decision is taken. The Secretary-General of the United Nations, Mr. Kurt Waldheim, will appoint the new Rector with the agreement of the Director-General of Unesco, Mr. Rene Maheu, joint sponsors of the university.

The University Council, the governing body of the new autonomous network of post-graduate institutions, will focus on research into what its Charter calls "pressing global problems of human survival, development and welfare". Its approach will be primarily action-oriented, multi-disciplinary and universal. More than 20 countries have so far offered to house the research and training centres where this work will be done.

Twenty-four members in their individual capacity were named to the University Council on 3 May (including Asa Briggs, Vice-Chancellor of Sussex University, Marcolino Candau of Brazil, and Eric Williams of

Trinidad and Tobago) and held their first session shortly afterwards. One of the Council's first acts was to discuss possible programmes for the UN university.

The council also issued an appeal to governments, individuals and foundations to follow the lead of Japan, which will house the university's administrative centre and has offered \$100 million to an endowment fund over five years.

Supporting this appeal in Paris the Unesco Assistant Director-General for Education, Mr. Amadou-Mahtar M'Bow, who attended the first Council meeting emphasized that the new university will depend entirely on voluntary contributions.

The Rector will propose the university's programme and budget, for approval of the Council. He will also "co-ordinate the total research and training programmes of the university with the activities of the United Nations and its agencies and, so far as possible with research programmes of the world scholarly community."

India to join U.N. Varsity

INDIA is likely to join the U.N. University which is going to be established next year with headquarters at Tokyo. At

present India is represented by Mr. G. Parthasarthy, former Vice-Chancellor of Jawaharlal Nehru University at the executive committee of the university. So far 25 governments have agreed to be associated with the university.

The U.N. University will assist universities and research centres in programmes of modernisation. It will conduct action-oriented multi-disciplinary studies on pressing global problems including study of international relations and peace, problems of development and influence of science and technology on environment and quality of life.

Vice-Chancellor felicitated

"I WILL work with you as a fellow worker, leader and guide for increasing the agricultural production in the state", declared Dr. C. Krishna Rao, Vice-Chancellor, Andhra Pradesh Agricultural University (APAU). He was replying to the felicitations by the various employees, organisations of the APAU recently at the Agricultural College, Rajendranagar. He was visibly over whelmed by the welcome and affection and by the well disciplined and well organised meeting of the employees.

Saying the APAU is a large organisation in the State, he explained to the employees the problems inherent in such organisations.

Referring to the changing circumstances and in a lighter vein to the "Financial Drought" in the University, Dr. Rao expected that the resources of this University shall be improved and the University's place of pride shall be kept up, only with the collective wisdom, coordinated effort and strength extended to him by all the members of the staff irrespective of their status and position, who by putting their shoulder to the wheel, enhance his enthusiasm in this direction.

Higher Education in Bulgaria

IN the period from 1878 to 1944, that is from Bulgaria's liberation there were only six higher educational establishments where about 10,000 students were trained in 25 different specialities. Before September 9, 1944, no engineer had been trained in Bulgaria.

Now the number of higher educational establishments has increased fourfold and the number of students—tenfold. At present more than 104,000 young people are studying 180 specialities in two academies, three universities and 22 institutes (half of them schools of technology). Bulgaria ranks among the first countries in the world in the number of students per 10,000 of the inhabitants and in the number of experts with higher education per 1,000 people. It is planned for the number of those studying in the higher educational establishments

to reach 146,000 by 1980 and 200,000—by 1990.

Higher education in Bulgaria is free of charge, and the State shoulders a considerable part of the students' expenses. All boys and girls who obtain marks higher than four (according to a six-mark system) are given scholarships graded according to the incomes of their families; the rent paid for lodgings in the students' hostels (where almost one-fifth of the students live) is only a token one (80 stotinki a month), and those taking their meals in canteens pay only 50 per cent of the cost of the food.

Besides students' hostels, houses of culture, polyclinics, sports grounds and communal service establishments are also being built. There are also creches and kindergartens for married students' children. Students who are mothers are allowed to postpone their examinations for three years; they are also paid children's allowances.

Much has been done to provide students with facilities for holidays and recreation. Holiday houses have been built in the best resorts and there is accommodation in them for 20,000 students who pay less than 30 per cent of the cost of their holidays.

The planned development of Bulgaria's economy ensures work for all students who graduate from the higher educational establishments.

U.P. Universities Bill gets Assent

THE U.P. Universities (Re-enactment amendment) Bill 1974 as passed by the State Legislature has got the assent of the President. The Bill seeks to repeal the earlier U.P. State Universities

Act, 1973 with certain modification to provide for the establishment of three more universities at Faizabad, Jhansi and Bareilly respectively. The Bill also provides for the establishment of two more agricultural universities one each at Faizabad and Kanpur.

PM to inaugurate World Hindi Convention

THE Prime Minister, Mrs. Indira Gandhi, will inaugurate a World Hindi Convention in Nagpur some time in December this year. The convention is being sponsored by the All-India Rashtrabhasha Prachar Samiti.

Besides Ministers and scholars from Fiji, Trinidad and Surinam, the delegates will include the Mauritius Prime Minister, Sir S. Ramgoolam. A sizable delegation is expected from the Soviet Union as also from the Asian, American and European universities. The delegates and observers from international organisations like the UNESCO and the PEN are also being invited.

The purpose of the convention is to review the role of Hindi in its national and international perspective and to evaluate its achievements and potentialities as an instrument of service in the present world context.

Seminar on Control of Narcotics

A SOUTH-EAST ASIAN SEMINAR on the Prevention and Control of Narcotics Abuse will be held in Jakarta for six days from November 7.

The seminar which will be held in cooperation with the World Health Organisation (W.H.O.) will aim at discussing ways and means of preventing wide distribution of narcotics and of improving the knowledge and skills of officials in charge of rehabilitating narcotics addicts. The seminar will be attended by delegates from

Change in convocation system

THE Mysore University Senate recently approved a change in the present convocation system. The Vice-Chancellor of the University, Prof. D. Javare Gowda, said that the Senate has approved the recommendations of the University Syndicate according to which the attendance at the convocation would be limited to only postgraduate degrees, postgraduate diplomas, doctorate and winners of prizes and medals.

The award of degrees at the undergraduate level will be done in the respective colleges themselves. The new system will come into force from the current year and is subject to the approval of the Chancellor of the University.

South East Asian countries which are members of the World Health Organisation.

Correspondence course by Bhopal Varsity

BHOPAL University will start Correspondence Course from July, 1975 for degree classes (Part I & II) in Arts and Commerce. The sanction of UGC and MP Uchcha Shiksha Anudan Ayog has been obtained. Students of Madhya Pradesh and outside are eligible for admission. Medium of instruction (through Correspondence) and examination will be Hindi or English.

Anyone, who has passed Higher Secondary/Pre-University/Intermediate of any Board or University in India, can enrol in the Correspondence Course with the Bhopal University.

New laboratory inaugurated

THE Nuclear Magnetic Resonance Laboratory, in the Department of Chemistry of the Guru Nanak University, was inaugurated recently by Professor S. M. Mukerjee.

The Nuclear Magnetic Resonance Spectrometer, the only one in the States of Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir, Chandigarh and Rajasthan, costing Rs. 6.5 lakhs and imported from Czechoslovakia, installed in this laboratory, has started working. It would be available for some specialised measurements to the researchers and technicians of other institutions and organisations as well.

Apart from this Spectrometer, other equipment installed in the Chemistry Laboratory includes; X-ray Diffraction Equipment, Mossbauer Spectrometer, Infrared Spectrophotometer, UV/Visible Spectrophotometer, Differential Thermal Analysis Equipment, Gas Chromatography Unit, Magnetic Susceptibility Measure-

ment Assembly, Hydrogenation, High Pressure and Normal Pressure and Electro Analytical Equipment, as well.

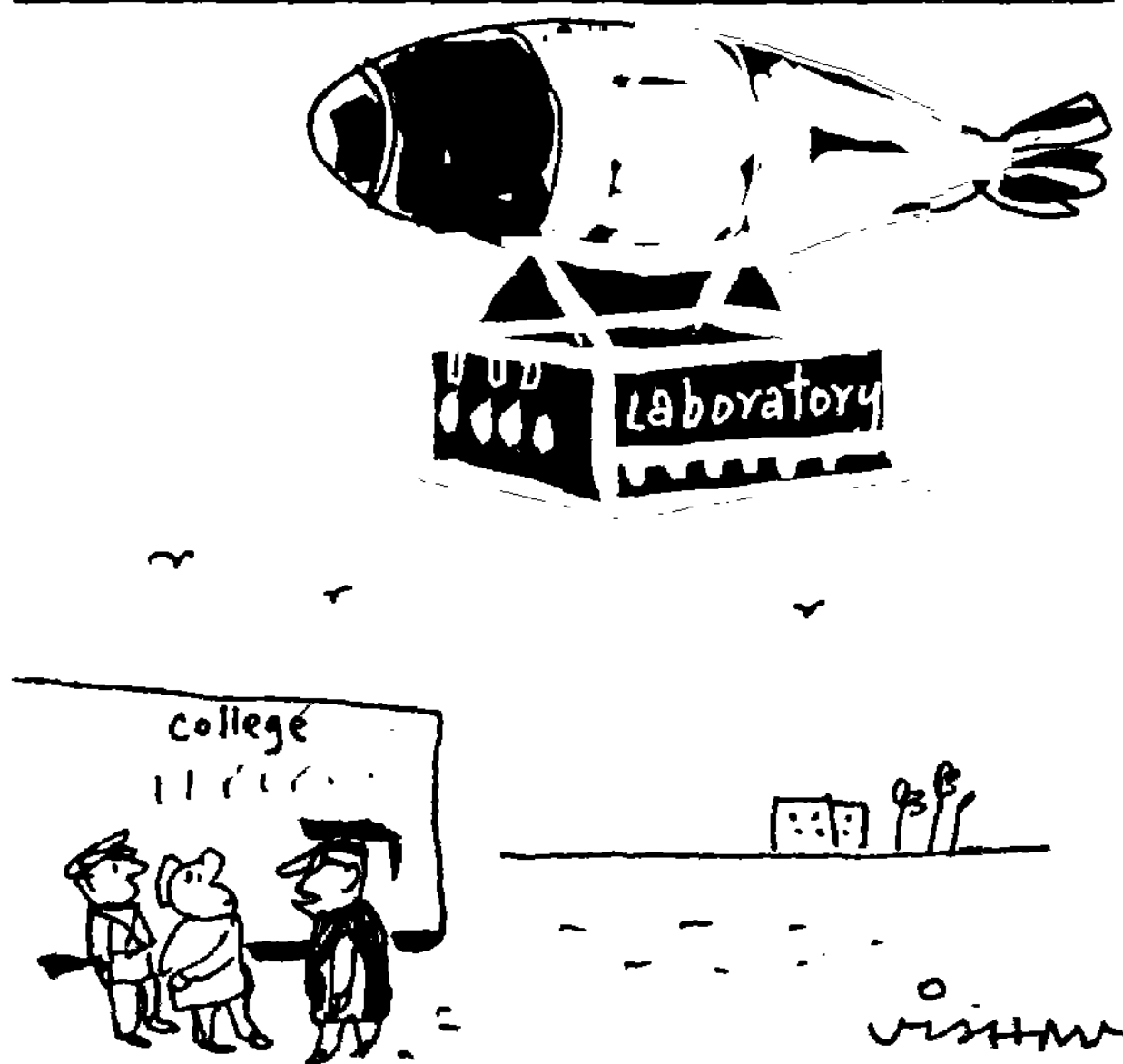
UAS team visits APAU

WITH a view to study the growth, development and achievements of research, education and extension in agriculture and allied sciences, a 9-member team representing the Board of Regents, University of Agricultural Sciences (UAS), Bangalore visited the Andhra Pradesh Agricultural University (APAU) recently. Mr. S. Vittal Rao, Headquarters Deputy Director Research, APAU accompanied the team and took the members on a guided tour of the Rajendranagar Campus.

The members visited the All India Coordinated Projects of Poultry, Rice and Sorghum as also the Agriculture and Live Stock Research Institutes, Colleges of Agriculture and Veterinary Science.

Classification Research Conference

THE Third International Study Conference on Classification Research will be held at the Bhabha Atomic Research, Trombay, during January 6-11, 1975. The Conference is being organised by the International Federation for Documentation and the Committee on Classification Research and is co-sponsored by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). The Bhabha Atomic Research Centre will be the host. The theme of the Conference is: Ordering Systems for Global Information Networks. The subjects covered will be : (1) Linguistic Research in Classification and Information Processing, (2) Recent Developments in the Theory of Classification and the Role of Classification and Other Switching Mechanisms in Global Information Network, and (3) Impact of Modern Technology on Information Systems.



"We decided to make it permanently airborne because it is being blown up into the sky by students half the time..."

Immigrants educational needs

U.K. to set up special unit

THE British Government is to establish a new unit in the Department of Education and Science to consider, among other things, matters connected with educational disadvantage and the education of immigrants.

Terms of reference

The terms of reference of the educational disadvantage unit are:

To serve as a focal point for consideration of matters, at all stages of education; connected with educational disadvantage and the education of immigrants;

To influence the allocation of resources in the interests of immigrants and those identified, on the best currently available criteria, as suffering educational disadvantage;

To develop, in association with the assessment of performance unit, other relevant criteria to improve this identification; and

To establish suitable arrangements for promoting good practice by the educational system in its treatment of the disadvantaged and of immigrants.

The Government has welcomed the Select Committee's report and accepted that it contains valuable suggestions for action. Although the Education Service has achieved significant success in meeting the needs of immigrants and their children, the Government agrees that much remains to be done. It accepts that members of the immigrant communities recently established in Britain have specific educational needs, and believes that where immigrants and their descendants live in the older urban and industrial areas the majority of their children are likely to share with indigenous children of those areas the educational disadvantages as-

sociated with an impoverished environment.

Special help

Immigrant pupils will accordingly benefit increasingly from special help for all those suffering educational disadvantage. But at the same time this special help must be given with due regard to the distinct needs of different ethnic groups and of individuals whatever their origin. The White Paper affirms the importance which the Government attaches to advancement of racial harmony and the part to be played by the Education Service in the achievement of this aim.

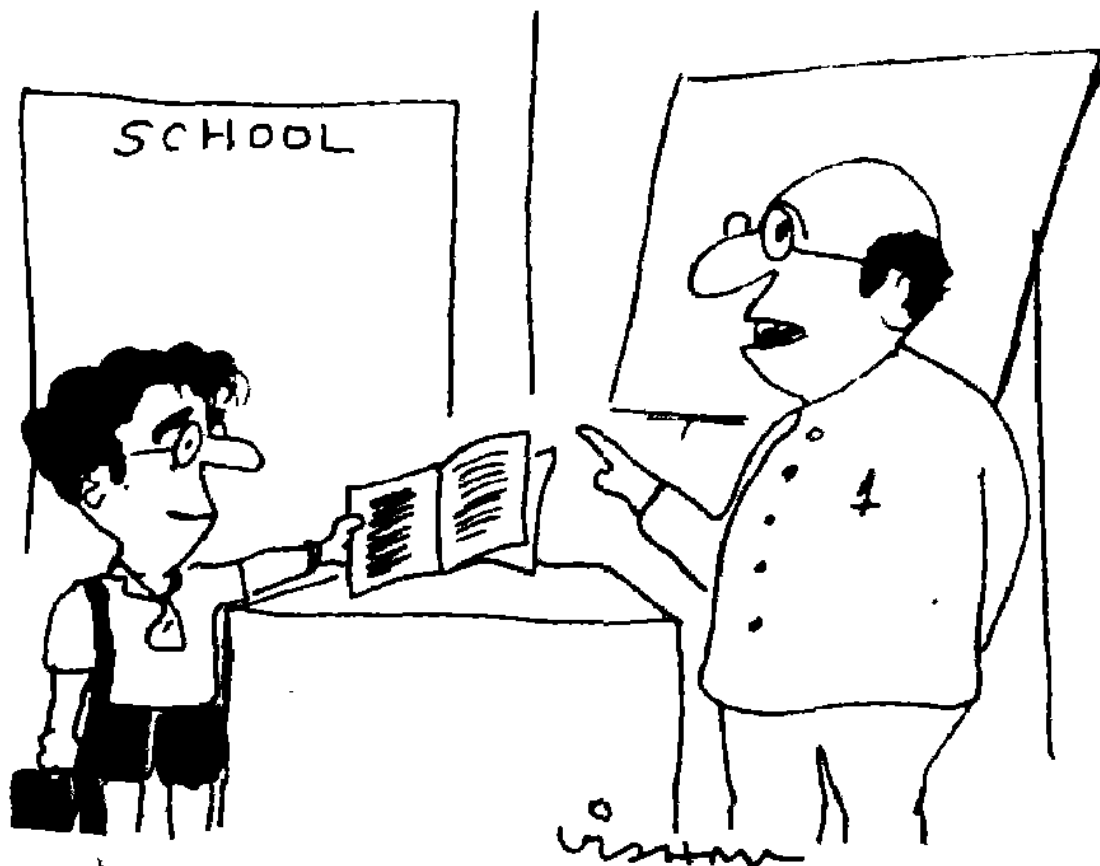
Referring to the responsibility resting on teachers to enable pupils and students to learn more about the cultural traditions of the countries of emigration as well as of Britain, the White Paper

welcomes the recently published report—"Teacher Education for a Multi-cultural Society"—of a joint working party of the Community Relations Commission and the Association of Teachers in Colleges and Departments of Education. Reference is also made to the work in hand to produce curriculum materials on the theme of education for a multi-racial society.

PG course in Journalism

DELHI University is likely to start a post-graduate course in Journalism from the next academic session. The department is likely to function on the pattern of Delhi School of Economics. It will have facilities for research as well. Uptil now the University of Delhi did not have any course in Journalism. A committee has been constituted by the university to suggest the details of the course.

As early as 1954, the university thought of starting a diploma course but the proposal could not materialise as the Panjab University at that time was al-



"Sonny boy, so you found a mistake in the text book. Have you ever stopped to think that it might have been put there for boys to correct as a part of their education?"

ready running a diploma course and the classes were held in one of the colleges of the Delhi University. Since then various attempts have been made. In view of the local demand for journalists in different spheres, the university has decided to consider the matter urgently and a full time Master's degree course may be instituted shortly. At present only BHU, Calcutta, Mysore and Punjab Agricultural University offer post-graduate course is Journalism.

Students on Academic Council

DELHI University will have for the first time students representation on its Academic Council. Under the amended constitution of the Academic Council five students of the university would be sitting along with other academics on this decision-making body. One student shall be a research student, two post-graduates and two under-graduate students. The student members shall have such qualifications for eligibility and shall be elected in such a manner as may be laid down by the ordinances in that behalf. They shall hold office for one year. The representation of teachers has also been altered. There would be twenty teachers of the university elected from among themselves by the teachers and there shall be at least four Readers, two women teachers, one teacher from the Faculty of Medical Sciences including Ayurvedic and Unani systems of Medicines and one teacher from the non-medical faculties imparting instruction in other professional courses.

Physiological Scientists Conference

NEW Delhi hosted the 26th International Congress of Physiological scientists this year. The President of India, Mr. Fakhruddin Ali Ahmed, formally inaugurated it on October 20, 1974. There were about 2000 delegates. The largest foreign contingent came from the USA. It is for the first time that this conference is being held in India. Dr. Hargobind Khorana gave the key address at the inaugural function and explained his work in the field of Genetics. Dr. Karan Singh, Union Minister of Health and Family Planning, Professor Yngve Zotterman, President of the International Union of Physiological Scientists and Dr. B. K. Anand, President of the 26th Congress also addressed the Conference. Dr. S.K. Manchanda, Secretary-General of the Congress read messages received from all parts of the world. (Detailed report will be published in the next issue).

Punjabi Varsity Honours Dr. Khorana

Dr. Hargobind Khorana, the Indian-born American Scientist and Noble Laureate who visited the country in connection with the 26th International Congress of Physiological Scientists was conferred the Honorary Degree of Doctor of Science by the Punjabi University, Patiala, at a special function held in New Delhi. He has also been made Fellow of the All India Institute of Medical Sciences. While receiving the degree from Shri M.M. Choudhury, Chancellor of the University, Dr. Khorana remarked that his home-coming had been rewarded in very many ways. Dr. Khorana intends visiting various research centres in the country to explain his present work which has centred round the construc-

tion of the DNA molecules. Dr. Khorana has been elected member of the National Academy of Sciences, Washington. He is also the Fellow of the American Association for the Advancement of Science.

Madurai V. C. passes away

THE Vice-Chancellor of Madurai University, Dr. M. Varadarajan died on October 10, 1974 at General Hospital, Madras.

Dr. Varadarajan, 62, has been Vice-Chancellor since February 1971. Born in April 1912 at Tirupattur, North Arcot District, he served as lecturer, professor and head of the department. During his tenure as Vice-Chancellor of Madurai University he was responsible for introducing correspondence course, Madurai being the first university to do so. An eminent Tamil scholar Dr. Varadarajan had written about 75 books comprising short stories, novels, literary criticism and linguistics. He was awarded the Sahitya Akademi Award for his novel 'Agal Vilakku.' He was the recipient of Honorary Degree of D.Litt from Illinois University. Among the countries visited by late Dr. Varadarajan were USSR, Malaysia, Singapore, Paris, Ceylon, England, Germany, Italy, etc.

Glowing tributes were paid to the memory of Dr. Varadarajan by the State Education Minister, Health Minister and the Chief Minister of Tamil Nadu. The Governor, Mr. K. K. Shah, who is the Chancellor of the University said that he "was one of the most successful vice-chancellors at a time when it was difficult to create rapport with the younger generation." The Pro-Chancellor described the death of Dr. Varadarajan as "an irreparable loss to Tamil and the Tamil world."

UNIVERSITY OF JODHPUR

(Establishment Branch)

Advertisement No. 6/74

APPLICATIONS are invited for the following posts :—

1. Professor of Hindi

Scale : Rs. 1100-50-1300-60-1600.

Qualifications : Essential :

- A first or high second class Master's degree of an Indian University or equivalent qualification of a foreign University in the subject concerned.
- Either a research degree of a Doctorate standard or published work of a high standard.
- Teaching experience at a University or College of about 10 years with at least five years of post-graduate work and experience of guiding research.

Professor of Law

Scale : Rs. 1100-50-1300-60-1600.

Qualifications : Essential :

- A first class LL.M. or LL.B. with a post-graduate degree in Humanities or Social Sciences with about five years experience at bar.
- Administrative and teaching experience of at least five years as Head of an Institution.

3. Reader in Geology

Scale : Rs. 700-50-1250.

Qualifications : Essential :

- A first or high second class Master's degree of an Indian University or equivalent qualification of a foreign University in the subject concerned.
- A research degree of a Doctorate standard or some published work.
- Experience of teaching post-graduate classes for at least 5 years.

Posts carry allowances and other benefits as may be admissible under rules from time to time.

Qualifications as mentioned above may be relaxed in cases of candidates who are otherwise found suitable. The University reserves the right to consider the cases of persons for appointment as Professors or make offers to persons who may not have applied. Higher starting salary is possible to exceptionally qualified candidates. Persons applying from abroad will be considered in absentia.

Application forms can be obtained from the undersigned for which a crossed Indian Postal Order for Rs. 2/- endorsed in favour of the Registrar, Jodhpur University payable at Jodhpur be sent alongwith a self-addressed envelope of 24 x 11 cms. bearing postage stamps of 85 paise. The last date for receipt of applications is November 20, 1974. The Vice-Chancellor may at his discretion condone delay in receipt of applications.

S. Chakrabarti
REGISTRAR

SAURASHTRA UNIVERSITY

APPLICATIONS in the prescribed form are invited for the post of PRINCIPAL for University conducted (1) Sir P.P. Institute of Science and (2) M.J. College of Commerce, Bhavnagar in the scale of Rs. 700-40-1100.

The posts are permanent and carry benefit of Contributory Provident Fund. Dearness allowance will be paid as per rules. Free housing accommodation will be provided. Higher initial pay in the scale may be considered in case of exceptionally qualified and experienced persons. Qualifications and experience relaxable in special cases. Candidates in employment must submit their applications through their present employers. Candidates if not knowing Gujarati will be required to pick-up within a reasonable period. Age ordinarily not exceeding 55 years.

The candidate must have the minimum qualifications and experience necessary for recognition as a Professor and at least ten years teaching experience as a lecturer and/or Professor in a subject included in the Science Faculty, [for post (1)]; Commerce Faculty, [for post (2)]; except languages. Administrative experience as the Head of the Department in any college or a Ph.D. Degree in Science for post (1), Commerce for post (2) : subject will be considered as additional qualification.

Application forms and details of other qualifications and experience required will be available from the Registrar, Saurashtra University, University Campus, Kalawad Road, Rajkot on sending a self-addressed envelope of the size 23 x 11 cms with postage stamps worth 65 paise.

Application in six copies accompanied by Indian Postal Order for Rs. 5/- crossed in favour of Registrar, Saurashtra University, University Campus, Kalawad Road, Rajkot should reach this office on or before 30-11-1974

Rajkot
Date

V. M. Desai
REGISTRAR

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

Notification No. 9

APPLICATIONS in six prescribed forms are invited on or before 26th December, 1974 for the following posts. Prescribed application forms will be available from the undersigned along with the details of qualifications on pre-payment of Re. 1/- by means of Crossed Postal Order.

- Professor of Continuing/Adult Education
- Professor of Applied Arts
- Professor of Electrical Engineering (Power)
- University Librarian
- Reader in Physics
- Reader in Mathematics

Scales: Professor: Rs. 1100-50-1300-60-1600, Reader: Rs. 700-50-1250:

Plus D.A., H.R.A., P.F. and Gratuity benefit as per University Rules.

Candidates if called for interview will have to come for interview at their own expense. The application form should be accompanied by Crossed Postal Order of Rs. 7-50.

K.A. Amin,

UNIVERSITY REGISTRAR

UNIVERSITY OF RAJASTHAN JAIPUR

Advertisement No. 2/74

APPLICATIONS are invited (through proper channel in case of those already in employment), so as to reach this office on or before 16-12-1974, in the prescribed form available from the Registrar's office on pre-payment of Rs. 4/- (Rs. 2/- extra if required by post) for the undermentioned posts:—

1. Professors: Economics-2, English-1, Geography-1, Political Science-1, Public Administration-1, Sanskrit-1, Sociology-1, Hindi-1 and Mathematics-1 in the grade of Rs. 1100-50-1300-60-1600.

2. Readers: Economics-3, English-2, Psychology-1, Political Science-2, Public Administration-1, Sociology-1, Music-1, Botany-1, Zoology-1, Law-1, Adult Education-1, Chemistry-4 (including 2 under the special Assistance Programme of UGC), Business Administration-1 and Accountancy and Business Statistics-1 in the grade of Rs. 700-50-1250.

3. Lecturers: Economics-4, Drawing and Painting-1, Philosophy-1, Psychology-2, Political Science-3, Sanskrit-1, Sociology-2, Urdu-1, Library Science-4, Zoology-3, Geology-2, Botany-6, Chemistry-6, Mathematics-3, French-1, Economic Admn. and Financial Management-1, Accountancy and Business Statistics-2, Business Administration-2, Law-3, Music-1, Research Associates in South Asia Studies Centre-4 Research Associates (Chemistry)-2, (Under Special Assistance Programme of UGC) X-Ray Analyst (Geology)-1, Micro-Analyst-1, (Chemistry), in the grade of Rs. 400-40-800-50-950.

4. Asstt. Director Physical Education: 2 in the Scale of Rs. 400-40-800-50-950.

5. Junior Research Fellows: (South Asia Studies Centre)-2 on consolidated salary of Rs. 300/- p.m.

6. Assistant Registrar: 3, in the scale of Rs. 400-30-640-40-800.

Details of qualifications etc. may be obtained alongwith the prescribed application form or separately as the candidate may desire. Benefits of provident fund, D.A. and other allowances will be admissible as per University Rules. Candidates will be called for interview at their own expenses. Retired persons need not apply.

The University reserves the right to alter the number of posts in any category or subject.

L.P. Vaish
REGISTRAR

PHYSICAL SCIENCES

Mathematics

1. Dudh Nath Singh. Multigrade equations. Bhagalpur University.
2. Patel, Sukaran Ram. First order reactants and statistical theory of turbulence. I.I.T., Delhi.
3. Pohanerkar, Sudhakar Govindrao. Problems in hydrodynamics heat transfer and lubrication theory. Marathwada University.
4. Sharma, Sunil Kumar. Application of the solution of Integral equations in the determination of orbits. Bhagalpur University.

Physics

1. Bhandari, Surendra Singh. Mossbauer effect and its applications. University of Udaipur.
2. Gupta, Mohan Lal. Characterization and applications of monolithic integrated circuit resistors and capacitors. I.I.T. Delhi.
3. Prabhakaran, A.K. Impurity-induced lattice vibrational modes in non-metallic crystals. I.I.T. Delhi.

Chemistry

1. Goudar, Timmanagoud Ramanagoud. Physico-chemical investigations on complexes of some transition metals. Karnatak University.
2. Khanna, Indresh. A study of some plant saponins. University of Delhi.
3. Manakiwala, S.C. Studies in chalcones and related compounds. Gujarat University.
4. Murdia, Mahavir Singh. Kinetics and mechanism of oxidation of some organic compounds (Aldehydes). University of Udaipur.
5. Patel, S.B. Physico-chemical studies of systems containing cellulose and solutions of cross-linking compounds. Gujarat University.
6. Rengarajan, K. Aryliodoso acetates as oxidants. University of Madras.
7. Robert, D.N. Physico-chemical studies in the separation of coumarins. Indore University.
8. Rochlani, Mohan Lal. Photometric studies of the complexes formed by iron-choline citrate with folic acid and with glycine. Indore University.
9. Shah, R.V. Synthesis of compound of physiological interest: Synthesis of basic amidy and thiazolidinony. Gujarat University.
10. Srivastava, Jai Narain. Studies on thiotropolone and its metal chelates. University of Delhi.

Engineering & Technology

1. Behere, Shrikrishna Narayan. Studies in fats and oils. Nagpur University.

2. Mohammad Rafique Ullah. The study of the polyphenols of tea and their role in tea manufacture. University of Gauhati.

3. Wani, Ali Mohammad. Electromyogram synthesis based on fibre potential summation and muscle electromechanical dynamics. I.I.T., Delhi.

BIOLOGICAL SCIENCES

Biochemistry

1. Chakravarty, Tapan. Influence of visual deprivation and visual stimulation on the activities of some enzymes and on the contents of protein and nucleic acids in the optic lobes of pigeon. Nagpur University.

Botany

1. Thaker, Dharmendrakumar Natwarlal. Floristic and ethnobotanical studies on Kawant range forests in Central Gujarat. M.S. University of Baroda.

Zoology

1. Balasubramanian, K.S. Experimental studies on the role of pineal and photo-periodism on the hypothalamo-hypophyseal-testicular system in Indian weaver bird, *Ploceus philippinus*. University of Delhi.
2. Dabke, A.T. Study of mutagenesis in presence of protein deficiency in rats. Indore University.
3. Lohgaonkar, Ashok Laxmanrao. Biological studies on the clam *lamellidens corrianue*. Marathwada University.
4. Mehta, Dinesh Kumar Pannalal. Study on the biology of *Ophiocephalus gechua* (Hamilton Buchanan). Marathwada University.
5. Quazi Azmatunisa. Biological studies in Indian pulmonate snail *lymnaea*. Marathwada University.
6. Sriramachandra Murty, Vajiheyavajula. Studies on the taxonomy of fishes of the family cyprinidae and on some aspects of biology of *Barbus (Puntius) sarana* (Hamilton Buchanan 1822) from lake Kolleru. Andhra Pradesh, India. Andhra University.

Agriculture

1. Gandhi, Anand Prakash. Studies on soil factors affecting suitability of irrigation waters to salt tolerance of some crops. University of Udaipur.
2. Jadhav, Sampat Bhagwantrao. Studies on the effect of soil moisture regimes and nitrogen levels on Sorghum hybrid, CSH-4, *Sorghum vulgare* (Pers). Mahatma Phule Krishi Vidyapeeth.
3. Khandelwal, Gopallal. Studies on the blight disease of cucurb its caused by *Alternaria cucumerina* (E &E) Elliot. University of Udaipur.
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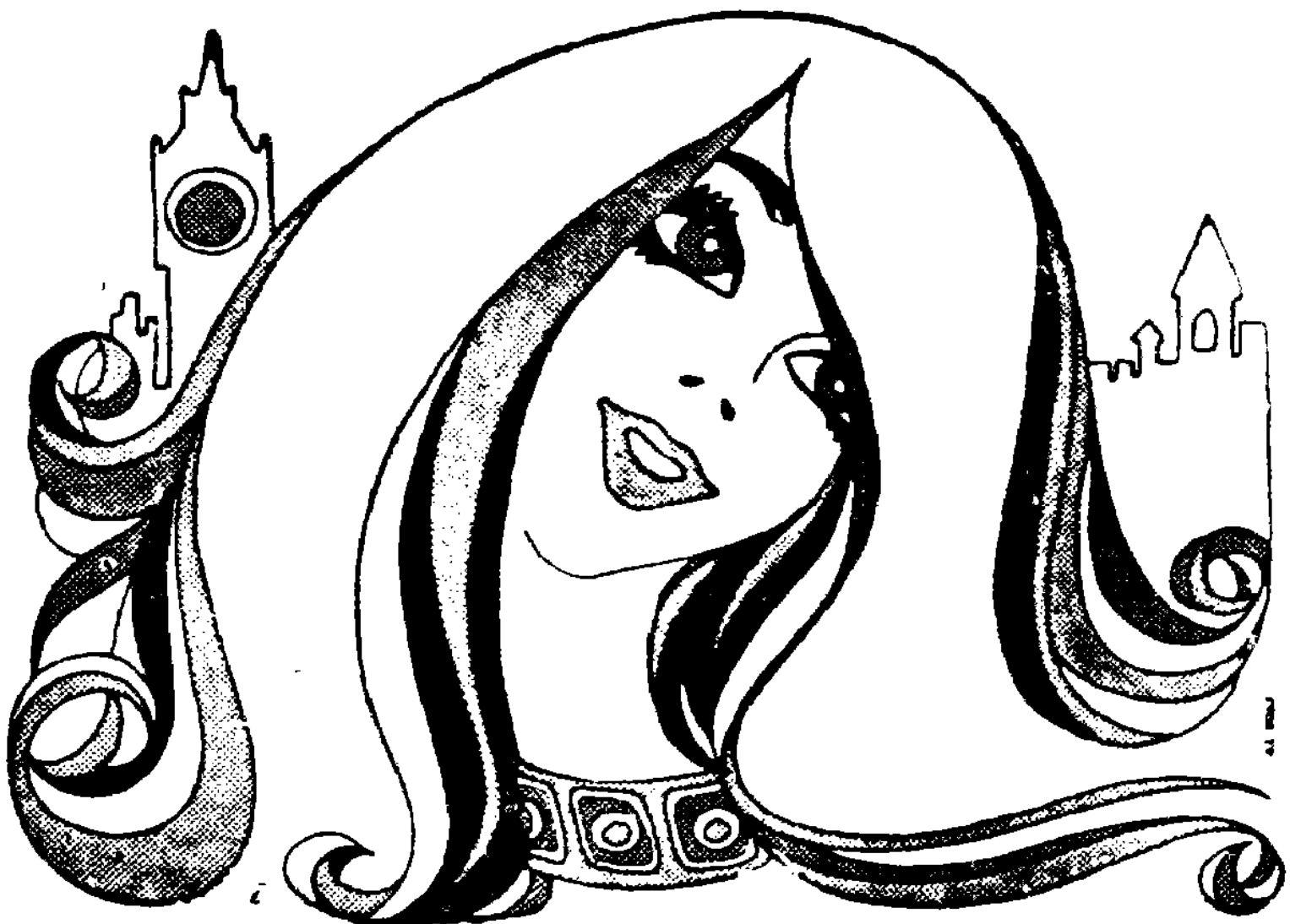
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(B) A Doctorate Degree with at least Second Class Bachelor's Degree OR (C) Any other equivalent degree or degrees of an Indian or Foreign University. (D) Five Year's experience of teaching Graduate-classes at the special or principal level (wherever applicable).

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Two copies of applications along with necessary enclosures should reach the Registrar, Shivaji University, Vidyanagar, Kolhapur-416004, on or before 15th December, 1974.

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Date : 16-11-1974 REGISTRAR

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The Candidate shall have:-

(i) A First or Second Class Master's Degree (with at least 48% marks) in the subject.

(ii) A doctorate degree or published work of equivalent standard.

(iii) Teaching experience in a College or in a University department for at least 8 years in the subject of which 2 years preferably be in P.G. Classes.

(iv) Capacity to guide research shall be regarded as an additional qualification.

Qualification for the Post of Lecturer (Political Science/Zoology)

The Candidate shall have a first or Second Class Master's degree (with at least 48% marks) in the subject.

Seven copies of the prescribed application forms will be supplied to the Candidates from the office of the undersigned on payment of Rs. 1.50 paise in person or by Bank Draft drawn on the State Bank of India, or by Money Order in favour of the Registrar, Berhampur University, Bhanja Bihar, Berhampur-7 along with a self-addressed envelope measuring 22 x 10 cms affixed with postage stamps worth 0.85 paise.

The applications duly filled in along with attested true copies of certificates testimonials and publications, etc., should reach the undersigned on or before the date specified below. Applications received after the due date will not be entertained.

Lecturer Political Science : 7-12-1974
Reader Economics and Lecturer Zoology : 21-12-1974

Candidates who are in service should apply through proper channels.

Persons in Government service selected for appointment shall be allowed leave salary and pension contribution for one year only if they wish to retain their lien under Government.

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Sd/-R.C. Rajguru
REGISTRAR

UNIVERSITY NEWS

Vol. XII
No. 12



DECEMBER
1974

A Monthly Chronicle of Higher Education

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Opinions expressed in the articles and reviews are individual and do not necessarily reflect the policies of the Association.

Our Commerce Education

THE importance of commerce education in the modern age of industrial development with sophisticated business operations can hardly be minimised. Commerce education has to play a vital role in the management of industries, trade and commerce, transportation, insurance houses and finally government departments such as commercial taxes, income taxes, auditing, etc. Commerce education aims at preparing personnel of various types for the different layers of management of business and government houses. It prepares personnel for wide spectrum of job opportunities available in the world of business and industries, which are non-scientific and non-engineering. There is a big controversy regarding the character and nature of commerce education. Some regard it as a liberal education and equate it with other social sciences and some regard it as a technical education. In fact, commerce education is both liberal and technical in character. The technical and liberal character of commerce education varies in its dimensions depending on the nature of competencies required for personnel working in different positions.

At the initial level it is expected to prepare typists, stenographers, book-keepers, despatchers, salesmen, receptionists, telephone operators and so on. Here, the nature of job requirements is such that a general proficiency in the language of work, and skills and competencies pertaining to specific jobs of the nature mentioned above have to be developed. These workers are not required to help the management in policy-making nor are they entrusted with any responsible assignment to exercise their discretion. They perform routine works in an automatic manner. What is required of these workers is the quickness, promptness and regularity. They should have developed these traits in their schooling to effectively function in industrial and business houses of today. According to the national pattern of education such workers can be trained at the higher secondary or junior college levels.

At the intermediary level commerce education prepares office assistants, marketing assistants, office supervisors, commercial clerks, accounts clerks, etc. These personnel should have standard proficiency in the language of work along with the specialised competencies. These personnel are entrusted with responsible work and function as aids to policy-making for the higher officials. They are expected to work in a team spirit, prepare and furnish correct information, draft letters, notes, memoranda, prepare circular letters, tenders, etc., and write accounts. These persons are expected to have good grounding in language and broad in outlook and understanding of the problems of their works and be suggestive to the solution of the problems. These personnel are required to exercise their discretion in their day-to-day work. They should have knowledge of statistics,

(Continued on page 13)

Role of Higher Educational Institutions in Development

Amiya Das Gupta

WHEN we discuss the role of higher educational institutions in the economic, social and cultural development of nations, we have to consider the issue from two aspects:

- what is the present role and
- what should be the role.

Again, if we limit ourselves to Asian countries, we shall find that there is a lot of commonness in the situation and problems faced by a vast majority of Asian nations, particularly those which had a colonial past and have just emerged independent and are fighting for economic, social and cultural regeneration of their countries. It will of course be wrong to try to oversimplify by generalised formulation covering all Asian countries as the stages of development are radically different at least in some Asian countries e.g. Japan and Afghanistan or India and Yemen. But even then we should not forget the similarities in the situation and tasks to be taken up in a big number of Asian countries.

Now let us start at the very beginning with a simple formulation of what should be the role of higher educational institutions especially in the newly liberated developing Asian countries. It has two vital aspects:

Firstly, it means re-orientating the Universities and Centres of higher learning—planning out higher education in keeping with the needs of applied research in the field of science, technology, industry and agriculture.

Secondly, there is the human problem i.e. reaching the higher culture generated by the universities to the mass of the people of the country, objectively playing the role of what Asian states wanted them to play as the “bugler, bridge and standard bearer” of a cultural revolution in each country.

To be more specific, the contribution of universi-

ties and institutions of higher education to national development is to be assessed on a number of grounds.

Firstly, institutions of higher education produce the national leadership in different sectors. So, the questions to be answered are:

- (a) How far the number produced is adequate for national needs?
- (b) How far the quality of education imparted to the young men and women is adequate for a developing and democratic society?
- (c) How far the opportunities for acquiring higher education are in keeping with developmental needs and democratic ideals?

Secondly, the courses offered, the methods of teaching, the opportunities for study and research in these institutions have all to be tested on the twin grounds of developments and democracy.

Thirdly, a further point of assessment is how far these institutions are attuned to the developmental needs of the nation, imbued with a spirit of patriotism and identification with the interests of the masses and equipped intellectually and ideologically to fight communalist, casteist, obscurantist and anti-scientific prejudices.

Let us now take a brief, swift look at the educational situation in the world in general and the Asian countries in particular, with special reference to the field of higher education.

In 1957, the population of the world stood at 2831 million, while it rose to 3069 million in 1961—an increase of 238 million inhabitants or 8.4 per cent. The corresponding figures for students' enrolment at the primary, secondary and higher levels of education was 363 million students in 1957 and 447 million in 1961—an increase of 84 million (of 23 per cent).

Coming specially to the field of higher education we find that in 1961, over 2 million students all over the world graduated from institutions of higher

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learning. The largest single percentage occurred in social sciences (24.7), followed by education (16.3), humanities (15.3), engineering (13.5) natural sciences (9.7), medical sciences (8.4), law (3.4), fine arts (3.5) and agriculture (3.1).

In the developing pattern of higher education it is possible to select 4 aspects of change which stand out as of major importance. These are the aspects of the influence of science and technology, of the trend towards planning and growth of regional and international co-operation. Together these interrelated factors are producing a profound movement—just as the first half of the century saw a tremendous expansion in secondary education, so the second half of the century will be remembered for an expansion of higher education that exceeds by far anything previously known.

A glance at the figures of India will demonstrate that in the 25 years since independence, education in India, particularly higher education, has expanded considerably. In 1946-47 the total number of colleges was 636, and in 1947 there were only 19 universities. In 1946-47 the total student enrolment in higher education was only 256,000. In 1970-71 the total number of universities was 84, of institutions deemed to be universities 9; of colleges of all types 3604 and of students on rolls was 3,112,404. Thus enrolment in institutions of higher education has gone up 12 times during that period.

A glance at comparative enrolment in different faculties indicates the following picture:

Faculties	1950-51 number	%	1970-71 number	%
Science	127,168	32.1	1,034,563	33.2
Engineering Technology	12,094	3.0	105,821	3.4
Agriculture	4,744	1.2	57,147	2.8
Veterinary science	1,101	0.3	11,204	0.4

This indicates that enrolment in educational faculties that might directly contribute to greater economic production has increased at a slightly more than proportionate rate.

Besides universities and science departments both of which have increased in number, centres of advanced research have been developed. Five agencies, covering the fields of agriculture, medicine, industry, defence and atomic research, have been established and developed. Each one of these agencies has a number of laboratories and research establishments employing a large number of scientific personnel. In addition, there is a number of laboratories and research departments under the various ministries of the Central Government and State Governments, and a number of cooperative research associations, established in collaboration with industry. The total number of scientific and technical research establishments (including university science departments) is roughly 1000, according to the 1969 Directory of Scientific Institutions in India. This, however, excludes agricultural research stations numbering 700.

So this expansion in India is really considerable, and on the face of it the achievements are significant,

but let us not forget for a moment the basic weakness of the situation. An indepth study will reveal how serious is the crisis infesting the entire system of higher education and research.

Let us take the case of research institutions first.

V.S.P. Kurup writing in Link (Independence Day number, 1968), says: "According to an estimate, the national laboratories have so far developed about 350 processes or techniques of which over 225 have been released for commercial exploitation. But because of industry's inherent hesitation in taking up any new process, only about 85 processes are in production now." This small bit of information is quite revealing.

First, these research institutions are mostly dislinked with industrial production. The faculties both ways. When the Government of India, on the basis of the Science Policy Resolution, started spending money on science, they set up expensive laboratories under university professors. The professors were interested and experienced in academic inquiry. So most of the laboratories worked on academic researches without bothering as to how their work might help contemporary industrial production in India. There was no liaison with industries, no planning of research on the basis of economic priorities. Industry, on the other hand, whenever desired to introduce modernisation and renovation and take to new processes, went in for foreign collaboration, simply because foreign collaboration would bring in the goodwill of the foreign company and offer an assured market.

These institutions are rootless in another way. They undertake no teaching work. The Report of the Education Commission (1964-66) has this to comment on the situation: "...at the present level of our resources it will be most unfortunate and short-sighted, almost suicidal, to organise fundamental research divorced from teaching... Institutions engaged in fundamental research and isolated from universities lack the critical and continuing challenge of fresh and youthful minds and cannot last for more than a generation even under favourable conditions. (pp. 415-416)

As a matter of fact the entire educational system in India suffers from deep-rooted evils. The entire orientation of the educational system is elitistic anti-manual labour, anti-working class. The only value that the educational system imparts is that of "competitive self-interest."

There is little or no involvement of universities in national efforts at modernisation or in achieving upliftment of the toiling masses. The orientation of research too is largely unrelated to national needs. As a result there is a tremendous gap between national needs and aspirations of the masses, including the youth on the one hand and the aims and purposes of institutions of higher learning on the other. This leads to three results. Frequent student explosion often misdirected; aimless teaching by teachers of universities and colleges and careerist utilisation of research for personal ends. This would be damaging anywhere in the world. This

is disastrous in the case of Asian nations, fighting against the curse of educational and cultural backwardness of nearly two centuries.

Physical and other handicaps suffered by the students and teachers are also too many. Most of the colleges and universities are overcrowded, ill-equipped with library and laboratory facilities. Courses offered are back-dated and disconnected from the modern socio-economic needs. Academic atmosphere is often tainted with communalism, casteism and obscurantism.

There are two other aspects which need special mention:

(1) The huge illiteracy still prevailing in spite of general expansion of education and the weak base on which the pyramid of higher education stands and

(2) The neo-colonialist penetration in the field of higher education.

In India, more than 350 000 000, i.e. 70 per cent of the population are illiterates. 40 per cent of these in primary school-going age-group do not get any schooling whatsoever, more than two-thirds of the age-group 11-14 do not enter the higher primary level and more than four-fifths of those in the age-group 14-17 do not reach the higher secondary level at all. Only about 4 per cent of the age-group 17-23 enter the portals of higher educational institutions.

Tasks

So the above discussion sums up the present position—the reality of to-day and from this naturally arise the tasks—the role that has to be played by universities and higher educational institutions.

The task in brief is as follows:

(a) To seek and cultivate new knowledge, to engage vigorously and fearlessly in the pursuit of truth and to interpret old knowledge and beliefs in the light of new needs and discoveries.

(b) To provide developing societies with competent young men and women trained in agriculture, industry, technology, the sciences (including social sciences) and medicine-trained youth who must also be imbued with a sense of social purpose. Educational institutions must be brought in closer cooperation with the economic and social activities of the nation outside the campus. A dedicated search for knowledge and taking that knowledge to the masses should be the aim of teachers and students alike.

(c) To build up and supply a vast army of dedicated educated young men and women and lead them in the crusade against illiteracy, ill-health, and appalling backwardness in the Afro-Asian countries—the legacy of our colonial past.

(d) To strive to promote real democracy in all Asian countries, based on equality and social justice and to reduce social and cultural differences through diffusion of education.

(e) To develop within each nation, through higher education, a sense of national pride and a sense of self-reliance, but at the same time, make the centres of higher learning and universities, symbols

of regional and international cooperation, thus cutting at the roots of chauvinism and racism.

In our country, if we are to make a serious effort to achieve these objectives, the following changes are a must:

(1) The present narrow weak base of higher education must be replaced by a broader and firmer basis of universal primary and secondary education.

(2) Education must be nationalised. The state take-over is necessary for putting an end to "laissez faire", elitist education and secondly for planned development of education. Nationalisation must be accompanied by democratisation of the entire educational system.

This means running of academic institutions by academicians and teachers and students. At the planning stage, there should be the representatives of the Government and mass organisations. The government should also have the right of financial audit and control as well as laying down policies through legislation and parliamentary legislation.

Universities and higher educational institutions should be thoroughly democratised. Education should be turned into a thoroughly cooperative endeavour of teachers and students within each faculty as well as between related faculties. Antiquated rules and regulations must go.

Neo-colonialism in the field of higher education has to be combatted.

In brief, the old feudal and colonial values and more contemporary bourgeois values must yield place to socialist and democratic values.

This means struggle, unceasing struggle, for change in the system as well as change in thinking and orientation. If the students and teachers can join together to fight this battle, they can find their legitimate place in the bigger battle being waged within the nation for development, for democracy, for secularism, for socialism.

The struggle first connotes that students must learn and teachers must teach. No doubt, struggle for improving conditions must continue. But the approach must be that the best utilisation of existing resources must be made. B. B. Seshachar in his presidential Address to the Indian National Science Academy on January 2 1973, quotes Dr. R. Ramanna of Bhabha Atomic Research Centre, who observes that most of the entrants into their organisation are so poorly equipped that special training facilities have to be provided by BARC after they are appointed, and comments that this indicates the sad stage of our university education.

The struggle secondly connotes that the entire community must learn to identify themselves with the interests of the masses. The best expression will be to launch a national anti-illiteracy drive.

Life, Romain Rolland says, is an eternal struggle without an armistice. Education, as part of life is no less so. Contemporary life, unfortunately had mixed up friends and foes, let us hope, future will give us better vision of realities and a better perspective of goals.

Excerpts from a Survey

Collegiate Education in Andhra

V. VENKATESWARA RAO

and

A.G.R. SAI SASTRI

COLLEGIATE education has been subjected to a number of changes in recent years. Frequent interference by non-academic men is believed, by some, as a primary cause for a number of problems in this regard. One can not altogether dismiss this charge as untenable. The stand of the authorities regarding the medium of instruction for instance at the undergraduate and the graduate level with little consideration for the opinion of students and their parents bears testimony to this. Teachers, so much concerned with implementation of these changes and with the welfare of their students, too, feel that they were not taken into confidence in framing the educational policies. Further, they deplore that they have no effective voice in academic matters and educational field has virtually become the monopoly of a few top men who generally fail to foresee the practical difficulties in the implementation of their policies.

The present survey attempts to collect the opinions of teachers in an organised way.

Materials and methods

A questionnaire with 13 questions relating to the various aspects of collegiate education was prepared and circulated to all the degree colleges of Andhra and Sri Venkateswara University areas for this purpose. Ten copies of it were sent to the Principal of each college with a request to get them answered by his colleagues (2 senior lecturers, 5 Asst. lecturers, 1 junior lecturer, 1 demonstrator/tutor in addition to the one meant for his own use) and, if other members on his staff feel like communicating their views, to use the same as a proforma. Of the 764 copies sent to 70 colleges in Andhra University area a total of 233 were returned (9 invalid) while from S. V. University area 113 were

received out of a total of 312 sent to 31 colleges. Repeated reminders did not improve this response.

A few copies were supplied to the delegates interested in the programme at the conference but only 8 were returned. In all, 51% of the colleges in Andhra University area and 51.6% from S.V. University area participated in the programme with enthusiasm.

Discussion and recommendations :

(1) Authorities should reconsider their policy on medium of instruction with majority of teachers suggesting Telugu at Intermediate level and English at degree level. However, a minimum, say, 40% of marks in aggregate at Intermediate level may be insisted upon as a prerequisite for admission into degree classes with English medium in all Colleges. Telugu medium students may be asked to answer at degree level at least one paper in English to facilitate their studies at post-graduate level. Provision should also be made for English medium sections in all colleges and publication of research journals and standard text books in Telugu language should be encouraged.

(2) The strength of a class (section) should be 40-50 at Intermediate and 30-40 at degree level instead of 80 and 60 as at present.

(3) Assessment of students at monthly intervals by a combination of written and oral tests should be made a regular feature. A combination of the present system of examination and internal assessment with a gradual increase in the percentage of marks from 20 to 50 allotted to the latter should become a standard procedure to evaluate the students.

(4) The quantum of syllabus introduced in recent years is too ambitious for the students to comprehend and for the teacher to cover. Hence it should be suitably reduced. With text books suitably designed and teachers properly trained to meet the new challenge, students can derive maximum benefit from the reform. Coordination in prescribing syllabi for undergraduate and graduate classes introducing recent advances in a phased manner is essential to safeguard the continuity of the studies in any discipline.

(5) The very fact that even those teachers to whom indiscipline does not seem to be a problem have offered suggestions to combat the present wave of indiscipline, paradoxically enough, underlines the gravity of the malaise. Tendency to attend classes without text books and attempts to destroy the college property for fun have been mentioned by a few respondents as types of indiscipline they notice in classroom in addition to those mentioned in the questionnaire e.g. indifference towards studies, causing disturbance.

Indifference of parents towards their wards, frustration of students as a consequence of failure to get admission into the course or medium of their choice, differences between teachers in a college,

lack of coordination between teachers and students, imposition of Telugu medium and impact of immoral public life have been mentioned by a few as root-causes for the present state of affairs in addition to those mentioned in the questionnaire. Some have felt that the very policy of the Government reserving seats and jobs for the use of members of certain communities has become the principal cause breeding indiscipline. Teachers with questionable conduct and insufficient learning, lenient attitude of the government towards students in general, indifference of students towards their studies and teachers, overcrowding in classroom and malpractices in examinations need a mention in this regard. Indiscriminate admissions into colleges, lack of administrative control and supervision over students, defective examination systems, purposeless education creating only problems for students after its completion, provocative events like frequent changes in curricula in the name of reform and excessive interference of politicians in the affairs of students often misguiding them for their own benefit should not be over-looked in this context.

The remedial measures consist of introduction of job-oriented courses, restricting admissions to meritorious students, improving teacher-student ratio, introduction of internal assessment with necessary safeguards, a ban on private tuitions and guides and curbing malpractices in examinations. Attempts

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to create confidence in the minds of students that they are assured of a bright future if only they come up well in academic career will have a salutary effect on discipline. Students should not be allowed to appear for the same examination more than thrice and prospective employers should be directed to seek the advice and opinion of the colleges where the applicants have studied. Seminars and group discussions encouraging students to visit the library at their leisure should form part of the routine work. Students including those of Scheduled Castes and Schedule Tribes getting scholarships should be evaluated at regular intervals for progress with a provision to terminate the scholarship if they are not upto the mark. A total ban on student organisations if possible or at least a way to direct their activities in a constructive way should be attempted. Associations of parents should be encouraged and they should be asked to keep a continuous vigil on the progress of their wards. Participation in National Cadet Corps, Social Service Schemes and similar other extra-curricular activities inculcating self-discipline should be made compulsory. Scholars with administrative abilities evoking spontaneous respect both from the staff and students should be appointed as principals. Provision should be made to punish erring students and teachers. Residential type of education with closer contacts between teachers and students and a possibility for individual attention should be introduced. Teachers should be encouraged to develop into active researchers and ideal persons for emulation by students. Added to these bureaux of information regarding careers and courses should be established at every college to help students choose their careers.

(6) Evaluation of teachers by students should be viewed against the many inherent defects the system has. Students are more emotional than rational in their judgement and may be easily carried away by extraneous factors like inducement by others rather than their teaching capabilities. They tend to like teachers who make classes interesting through irrelevant yet sustaining methods. Evaluation by students may degenerate into harassment and encourage teachers to please their students by hook or crook, thus polluting the entire atmosphere in the process. Caste and communal politics infesting most of the colleges will make the procedure undependable. With criteria of judgement varying from student to student no single teacher can satisfy all his students. Students may think that the teacher is at their mercy and may lose respect towards him. Hence necessary safeguards should be provided to overcome these defects before implementing the proposal.

(7) Though autonomous colleges assure bright chances for improvement in quality of education and student-discipline and eliminate the inordinate delays in examination mechanics, as many as 66% of respondents from Andhra University area and 50.4% from S.V. University area have rejected the idea outright on various grounds. Some argue that uniformity in educational set-up will be lost with

certain colleges misusing the free hand given in academic matters jeopardising the very cause of education. A few feel that the existing socio-political conditions are not conducive to take up an experiment of this sort at present. Some fear that autonomous authorities tend to become inefficient, corrupt and dictatorial. Further, without financial resources of their own, no institution can develop into a really autonomous one and so has to depend on Government for financial assistance which in turn serves as a leverage for petty politicians and corrupt officials. Abnormal differences in standards may confuse the public and handicap the degree-holders in competitive examinations at the national level. Many feel that the Academic Councils of the Universities with adequate representation for teachers will safeguard the standards of education better. Hence autonomous colleges are not desirable at present.

(8) Employment-oriented education should be given preference over the existing type and students should be trained according to their aptitude. Technical and vocational education promoting self-employment should be made compulsory upto the level of Intermediate, while specialisation should set in at degree level. The need of the society should be clearly assessed before the courses for study are framed.

(9) Provision should be made for compulsory refresher courses for teachers at least once in two years.

(10) Exchange of teachers, say for one term in an academic year, between sister institutions should be encouraged for the benefit of students. Teaching experience of some decades or proven scholarship supported by published work may be considered as a prerequisite for the exchange.

(11) Job-security should be provided to make teachers more efficient. However, inefficiency and dereliction of duty must never go unpunished. Hence job-security linked up with periodical assessment of teachers by competent authorities should be insisted on.

(12) A specific code of conduct may be provided for college teachers provided it does not hamper the growth of intellectual powers and free exercise of their talents.

(13) Teachers should be provided with facilities to get to know about the functioning of their counterparts in India and abroad. Experienced teachers and administrators may be deputed to other institutions for the purpose.

(14) Periodical surveys of the present type should be made by authorities and suggestions made for improvements should be implemented. ●

Innovative Education

G. M. Oza
&
P. H. Dave

TIME and again, members of the society from all walks of life have voiced their concern with regard to the education system prevalent throughout the country in recent years. This group does consist of the teachers and students as well. We talk about a change in the process of learning. In fact, learning can never be static and has for ever to undergo numerous drastic changes to fulfil the demands of the younger generation. This means, our education system should not be rigid. It has to adapt with the existing national environment if at all we wish to see the educational institutions survive else, some day the learning towers may break down, we fear.

The authors of the present note have no magical remedy to overcome the explosive and controversial problems connected with university education. They have humbly pleaded for Innovative Education—which according to them is a cry of time! For the implementation, co-ordination and carrying it out to a stage to meet with our cherished desires, we shall certainly need an army of educationists, industrialists and administrators.

This, however, carries us towards a long way. But, do we not feel that the reputed Indian centres of higher learning have failed miserably in achieving real education system which can be a

"That man, I think, has had a liberal education who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work, that, as a mechanism, it is capable of; whose intellect is a clear, cold, logical engine, with all its parts of equal strength and in smooth working order; ready, like a steam engine, to be turned to any kind of work, and spin the gossamers, as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great and fundamental truths of nature and of the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty, whether of nature or of art, to hate all villainess, and to respect others as himself."

—Thomas Huxley.

guide-line at the national level? The authors, at least on their part, are worried to a great extent sensing the waste of time, energy and money on the age-old existing education patterns which are responsible for frustration in the student community. Is the present education in any of our reputed Indian universities relevant to meet with the ever

changing demands of time and circumstances ? Definitely not, in any case we consider !

In this context the late Maharaja Sir Sayajirao Gaekwad of Baroda very rightly pointed out about 'Democracy—its relation to education' in following words :

"There will be a real democracy when every man, woman and child in a State is filled with an irrepressible desire to do everything possible to make the community better, stronger and freer, and this ideal cannot be achieved without an educated people."

Educated not only in letters but educated in those deep, and moral truths which are implied in the phrase "The Service of the Community".

In view of this, it will be in the fitness of things, if we really start sweating right now to remedy the situation before the society forces us to act according to their demands.

Innovative Education has to fulfil the purpose of a potent instrument of social, economic and political change, for, it has to be co-related with the programmes of national development and the varied nature of the problems that the country has to face during such stages: this amounts to relating Innovative Education to the aspirations of our countrymen.

Innovative Education can contribute significantly to achieve social and national integration. In recent years, the national unity is threatened with and there have been several hurdles in social progress. It is, therefore, essential that such education should establish its root system in the traditions of the people in order to achieve social responsibility, social organization and the feeling of loyalty for the country. This may, in time, overcome student unrest, strikes, lawlessness, corruption in public life and communal troubles, etc.

Innovative Education can help develop human resources. Present generations have to be lifted out of their age-long conservative environment through science-based education. This will go a long way in yielding better results in our agriculture, industry and a great diversity of problems related with our daily life.

The Innovative Education system can have effective impact on the university students. This would certainly provide the students with better opportunities to strengthen their potential abilities to a great extent and thereby helping to solve the national problems. In a way, the present trend is towards socialistic pattern of society and it is here such education will cater to the needs of individuals there by shaping them to be devoted citizens—a prerequisite for national development.

Students with the Innovative Education background will add to the competent professional manpower which is an asset in increasing productivity and promoting economic growth for the development of a nation.

Indifferent education, for instance, in many of the disciplines in the universities renders many graduates unemployed or are not fit to find an employment; this retards economic growth and creates social tensions.

For a democratic and a socialistic society, Innovative Education can help to cultivate a sense of moral and social responsibilities in the younger generation; such education can jolly well emphasize character-formation and make efforts to cultivate moral and spiritual values.

Our century old present educational system does need transformation. The traditional system of education is not at all to meet the present demands of the society, thus it would never contribute to the realization of the national goals. Hence the Innovative Education should have science as a basic component of education with provision for cultural and aesthetic growth through work-experience as its integral part. In fact, study of science should be a part of all courses in the humanities and social sciences and some elements of humanities and social sciences in the teaching of science. This would help the students to develop a scientific outlook in their way of life and culture.

With a view to relating education to life and productivity, work-experience under the Innovative system should be an integral part of the University Education. This includes participation of students in workshops, on farms, in factories and in several productive institutions. Thus, Innovative Education should consist of the following basic elements of education:

- (i) a study of language, humanities and social sciences for international understanding;
- (ii) a study of mathematics and natural sciences;
- (iii) work-experience (for relating education to productivity);
- (iv) social service (as a means of social and national integration); and
- (v) sports and games (as an integral part of education), etc., etc., in relation to help understand dignity of labour.

The authors hope that the educationists of India will give a serious thought to the idea of changing the very structure of education in relation to the demands of the society; and make the innovative education the very basis for structural change. ●

Education And Industry

Babu Dassani

PROPER education is the base of the materialistic and cultural progress of life. After independence the life has been affected very much by industrialisation which is the result of day to day scientific and technical development. Post independence scientific and technical education, training and research centers have been rapidly increased to fulfil the hot demands of different industrial set-up under the national planned programmes. But the question arises that which living is supplemented by the increasing unemployment amongst the highly educated youths, growing riots and irregularities in the educational institutions and the production well below the expected level in the industrial complexes.

The spreading mechanisation in present educational system is dangerous to rationalistic approach

to meet the arising challenges of the time. Today's education, apart from current problems of life, is unable to fulfil the increasing needs of the professional world. Present teaching is responsible to increase the gap between the practice and theory. That's why more and more problems are coming up. For a scientific and prosperous living it is needed to co-ordinate such lacuna through educational programme by introducing in it the real life problems caused with industries,

Dr. C.R. Mitra, Director, Birla Institute of Technology & Science, Pilani, is making efforts to coordinate the educational movement and industrial-social development through 'Practice School' programme thereby combining several countrywide industrial social institutions with the sophisticated scientific and technical background of the education to prove it more practicable and useful. Recently this Institute has started a new five-year integrated programme after making a total change in present educational set-up. One of them is practice school, consisting in each disciplines, aims to awake and make the students enable in taking practical decisions of the mechanical, social, human, economic and political problems in and around the industries.

Practical School Programme

According to various studies practice school programme is mainly designed with four standards. In first, practice school for engineering graduates of five-year integrated programme is consisting two months of summer coming at the end of the third year for industrial training, after this a total duration of five and a half months spreading over the later part of the summer at the end of the fourth year as well as the entire first semester of fifth year for experimental and analytical studies of interdisciplinary problems and again two months of summer coming at the end of fifth year for design practice. In second, the students of two years postgraduation in M.E. (Hons.), M. Pharm. and M.Sc. (Tech.) have a total duration of six months covering the last semester of final year as well as the first part of following summer for their practice school. The work of these students is same as for undergraduate students but the only difference is that the problems taken by these students are more oriented towards development and research.

"Mini-Practice School"

In third, the postgraduate students of five-year integrated programmes in M.A. (Hons.), M.Sc. (Hons.) and M.M.S. would have practice school for two months duration the summer coming at the end of third year and six months during the last semester of final year and first part of the following summer. The Pharmacy graduates of four-year integrated programme are also in the same category but having only one component which is to be of total duration of about six months spreading over the last semester of the final year and the first part of the following

The author is Research Fellow on New Hindi Poetry and also a Press Reporter.

summer. In fourth students from engineering disciplines who will not be going to practice school stations would be participating in such programmes which may also be termed as 'mini-practice school' programme. Under this scheme it is to be studied through various projects the challenges and needs of changing environment by the development of industrial complexes such as Textile Institute of Technology at Bhiwani, Haryana State Lift Irrigation Projects at Dadri and Bhiwani and Khetri Copper Complex Project, fifty miles radius around Pilani.

This time forty three organizations are selected for the practice school in the various parts of the country out of them eighteen have come in operation, rest of these have agreed to on the establishment of practice school and work yet to be started in near future. Among these organisations four are likely to pay stipends to students. According to different standards of the programmes consist the nature of practice school for engineering practice-9, Design Practice-5, Science Practice-11, Economics Practice-4, Management Practice-5, General Practice-7, Instrumentation-3.

These practice school students under the supervision of Institute faculty with the help of industrial, professional, social organization experts get the primary knowledge of operational system and introduction of real problems during the summer term coming at the end of third year. After this in the duration of six months school real life problems of industrial environment are solved by the students utilizing their knowledge which is gained in the classroom studies and through public material from time to time. These students in a heterogeneous group of three to four select the projects of their own subject and choice under the guidance of faculty members and industrial consultants. Every group of students has its own leader who has to take the entire responsibility for the planning, scheduling and implementing the various stages of task. On the completion occasion of this programme a seminar is formed to examine and evaluation of these projects at the station itself presided by the school's coordinator with the presence of the faculty members and industrial consultants.

This seminar aims to exchange ideas among students defending themselves by putting research studies and teachers expounding academic calibre and industrial consultants showing past practical experiences on the various aspects of such project for the implementation.

No doubt, practice school hopes for self-sufficiency through its working and with the help and co-operation among industrial experts and students instead of frustration and non-directiveness which is rapidly spreading in today's youth. The triangular association of industrial awareness in teachers, academic attachments with professional skills, proper incentives to students will provide refreshment and enlightenment to increase in the national youth power.

(Continued from page 3)

economics, commercial laws, income taxes, office practices and management, typing and accountancy. In the present pattern of our commerce education a good many of commerce graduates or post-graduates are only eligible for appointment for these posts. They can only provide the needed subordinate managerial leadership.

At the higher level of management; a good knowledge of the language of work, critical, broad and deeper understanding of the intricacies of the business along with the specialisation for specific jobs are required. They help the board of directors in taking policy decisions. We have professional bodies in the country to prepare chartered accountants, cost accountants and management accountants. Commerce graduates can take up such examinations for specialisation. At the higher level we require the products of business management courses. Business management courses prepare managers and higher officials for the various departments of business and industry. A manager is one who gets things done by working with the people and other resources; in order to reach an objective he coordinates the activities of others rather than perform operation himself. He gives guidelines and instructions in consultation with his subordinates for smooth operation. Managing is a social process because it comprises a series of activities that lead to the accomplishment of objectives. It is a social process in which actions are principally concerned with relations between people. For a good manager the knowledge of behavioral sciences, sociology, psychology and anthropology would be more useful for creating the right atmosphere for work. For taking a rational decision on the present and future working of the concerns a deeper knowledge of applied economics, logic, statistics, system analysis is a must. Methods and techniques of business forecasting is as much needed as the knowledge of operational technique of production and distribution. Management is a continuous process. There are always the possibilities of exploring new ideas and fields of operation, stimulating fresh minds and governing more people and providing leadership and creating a congenial climate of confidence in the office staff.

The differences between post-graduate courses in commerce and business management hinges around the role of managers of today. While for management courses any person of any discipline can join, only commerce graduates can join Master's degree course in Commerce. This difference in the nature of work invites the need for different courses of instruction, curricula, evaluation, and methods and techniques of teaching.

So far, commerce education has failed to restructure itself keeping in view the job competencies. Vocational subject must find its place in the curricula of commerce education. Some thoughtful reflection is essential to give a dynamic touch to the whole problem of restructuring of the courses and for this a thorough job analysis is essential.

—Uma Shankar Prasad

Universities, not service centres

CULTURE OUT OF ANARCHY

by Prof. Judson Jerome

Published by Herder
& Herder, New York
Pages 330 price \$ 9.50

SUBTITLED "the reconstruction of American higher learning" this book, written in three parts, attempts (a) to provide an overview of tertiary education in that country at the beginning of the 1970's, (b) to give brief descriptions of a few institutions which are attempting "truly radical alternatives to liberal education" and (c) to speculate about the emergence of a new system with entirely different purposes, plans, and processes of instruction.

The "overview" presented in the first four very stimulating chapters shows both keen insight and deep commitment. But in many ways it is essentially a personal view of the state of the American University. To appreciate it one must recall some of the compelling forces that could, in part, have motivated this particular view. Some of these are:

- (i) This book, like many recent works on American education, has grown under the whip of one of those wickedly wasteful wars which often succeed in destroying man's faith in both himself and his institutions. It was written at a time when the repercussions of the seemingly endless war in Vietnam were being felt at their worst on American university campuses and when many thinking minds within and outside the USA were beginning to doubt the value of higher learning in its present form.
- (ii) Especially since the middle

of the 1950's universities in the United States, as in many other democracies, have been receiving governmental patronage and, as a result, are having to pay the price for their mounting share of the public purse. A number of scholarly disciplines have found immediate and fruitful application in production and in military strategy. A concomitant of this "fruitful" flirtation with Federal funds is that research, especially committed and applied research, attracts some of the best men at many universities. Teaching, undergraduate teaching in particular, suffers a proportionate neglect. Scholars who consider universities as primarily the places for teaching and learning see in this development the end of the university as a truly liberating force.

- (iii) Closely related to this "misuse" of science and scholarship is the growing craze for research and publication. As never before, "publish or perish" and "publish for prosperity" have become the primary concern of most teachers not only in the postgraduate departments and centres of advanced study but in colleges meant for undergraduate work. For all the encouragement that this may provide to the growth of scholarship in different disciplines, it results in a neglect of all those aspects of general education which are related to the intellectual development and personal growth of the undergraduate. Besides, it

increases the dangers that accompany the production of narrow specialists (Ortega Y Gasset's "new barbarians")¹ who lack sensitivity not merely to the needs of their own students as individual beings but also to the humane concerns of man's life in society.

The direction for the author's probe into higher learning in his country must have been provided by the intense feeling produced in his highly sensitive mind by the developments outlined above. But there is perhaps another factor of decisive importance—the author himself. Like many of us who teach the young, Professor Jerome appears to be a partisan who is also a man of passionate beliefs. Very early in the book he takes the reader into confidence (some might allege that he "brainwashes" his reader), giving him a personal view of what is wrong and where to look for salvation: "All of us who want to change the educational system will first have to liberate ourselves. Our own education has burdened us with expectations, with ideas of duty, with a sense of guilt, which makes it difficult for us to approve of ourselves. To hide what we regard as our inadequacies, we cling to a fabric of lies as a security blanket. Now that blanket is being stripped from us—by the barbarous and candid young, by social forces intolerant of our established premises, by a world responding to domination by our civilization as to the grip of cancer. Those of us who successfully adapt to that situation in a way that will save our own skins will, I believe, emerge as happier and better people" (26-27). What follows in the book is coloured by these beliefs and, at least in parts, by a Marcuse-type suspicion of the "establishment" and faith in "student power."

The "overview" builds up a picture of failure and frustration, of falsehood and exploitation, of wrong values and outrageous attitudes. Both the institutions and their members are seen as suffering from a sad lack of educative purposefulness.

For most learners higher learning has become synonymous with degrees; they collect credits to earn degree in the same way as a housewife collects "green stamps" on her weekly shopping. For the under-privileged and the economically backward degrees merely provide an escape from the anonymity of their classlessness because "salvation, dignity and status are reserved for those who make it through to graduate school" (44). And, as in our country, the new status produces alienation.

Even at relatively better institutions the tone is scholastic without being intellectual, most colleges having lost sight of their concern with "helping students to become independent, self-judging and self-motivating, able to achieve and able to develop their fullest potential" (65). The administrators fare no better since the young have seized the initiative, and most institutional responses have become merely reactive. And the faculty: it is as directionless as the students, its efforts to adjust being often pathetic and amusing.

These are but a few of the numerous instances of decadence and demoralization that Professor Jerome sees as being characteristic of American colleges in the early 1970's. Together they add up to a picture of the university which has lost all claims to the academic or moral leadership in that country.

Much of what he shows is, though exaggerated, essentially true. Something must be fundamentally wrong with an education which creates so much tension, strife, and unrest, which fails to utilize the largest supply of intelligence (found among the blacks, the women and the poor, all of whom are disproportionately underrepresented) and which often appears to perpetuate the

evils that it ought to be used to eliminate. But what, one must ask, are the remedies?

Even at this stage (i.e., before he looks in Parts 2 and 3 at the alternatives and the emerging new system) Professor Jerome sees hope in some measures and failure in others. He also makes "a set of recommendations for immediate action."

American education, much like our own, breeds "educational wastage" largely because it is too open—the colleges admit everyone or almost everyone, who chooses to enter them for whatever reasons. The remedy ought to be equally obvious—make the admissions selective, admitting only those who can profit from and contribute to higher learning. Professor Jerome pooh-poohs this solution, arguing that such culling will leave in Mark Hopkins on one end of the leg and only the mirror on the other. Besides, it will put professors out of jobs and create institutions without libraries, laboratories, and other essentials of learning. What he recommends is a completely open-door policy on admissions because "No business, especially an education business, can succeed in our present cultural climate by being snobbish about whom it chooses to serve" (81). And to keep the colleges, especially private ones, "alive in the meantime" he adds a few other emergency measures. These include:

- (i) Colleges should stop doing as much as possible so that the campus provides only a portion of each student's education, leaving most of it to the experiential world around him.
- (ii) They should hire as much diversity as possible, avoiding Ph.Ds. and looking for credentials other than academic awards.
- (iii) They should run the campus as a cooperative, the ownership being jointly that of faculty and the students.
- (iv) They should "work with students against local poverty, disease, injustice, ignorance, instead of

working against students on the battlefield of assignments, papers and examinations" (81-82).

- (v) They should bring themselves into an essential relationship to the community by getting everyone involved in their programmes.

From a critical analysis of the dominant pattern in American tertiary system which includes the suggestions for its reform, the book moves on in Part 2 to a description of three types of institutions which are attempting alternatives to it. Of these the first type is represented by three colleges which provide "totally self-directed education" and in which "the boundary between life and study, experience and conceptualization" (119) is either blurred or totally non-existent.

At each of these institutions of free learning a number of the very basic essentials of the traditional college are becoming irrelevant and being thrown overboard. One of the three colleges offers no degrees rejecting the very notion as a corruption of free learning, the other two define their degrees purely in terms of time enrolled. The student-teacher relationship is radically different with staff often selected by or in consultation with students and selected more for their compatibility as "whole people" than for their competence in fields of study. The atmosphere is free both from protective artificialities and from institutional regulations.

How well does this alternative work? Perhaps it is too soon to tell. Each college has had its teething troubles and each is experiencing some of the difficulties that go with attempting to sail against the current. That such institutions exist is, on the one hand, indicative of the dissatisfaction with the system and, on the other, a tribute to the individuals who man them against all odds. To uphold academic freedom in a truly meaningful sense in a world full of temptations and "pressure groups" is no easy undertaking.

The second type of alternative, exemplified by two colleges, is different in the sense that it is based on revaluation rather than replacement and improved prescription based on a redefinition (in terms of content and curricula) of the aims of university education. The two colleges differ partly because each reflects a different vision of life and learning and in part because they are sponsored by two different types of agencies—one by the Society of Friends and the other by the State of New York.

The paths to perfection being different—in one college “through scientific problem-solving and the development of cooperative social organization” (157), in the other through the knowledge of “the abiding legacy of human culture, tempered and tested by direct engagement in contemporary issues” (157), the means used to acquire wisdom must also differ. Differences are also caused by the influence of Quakerism, which binds people in a sense of dedication, self-sacrifice, and simplicity in one college, and the spirit of free thinking with the fullest and freest expression of opinion and public debate that prevails in the other. Both colleges, however, differ from any ordinary institutions in many important ways. The atmosphere, the attitudes to learning, the human relationships, the degree and quality of commitment, which results in a “living dialogue” on the campus and the classroom show this all too clearly. In spite of this, (a caviling critic might say because of this) both institutions “are undergoing changes in leadership and direction, questioning the principles of prescription implanted by their founding fathers”. Also, in at least one college, both teachers and students are a little disillusioned by freedom that fails to produce results. In the words of a faculty member of one college: “I came here believing in Summerhill and all that. Now I just want some kind of arrangement so I can get these kids to do something (188). “The lesson, if any, is that truly radical alternatives require much more than vision, goodwill and

planning. And yet, their failures ought not to defer further experimentation.

The concluding chapter of Part 2 (Chapter 7) presents yet another alternative—that which is primarily marked by its unconventionality of curriculum, which provides for “colourful and varied routes to similar goals.” In this case the distinctive features of the genre are brought out by one college—Antioch Columbia, whose original aims—to create means to help students discover what they want and need and how best they can learn it, distinguish such institutions. The approach to the realisation of the aims is “a selective engagement with, reflection upon, and research into real problems and issues in the environment” (196) on the part of teachers and learners. Formal teaching assumes a clearly secondary role.

The most outstanding results of this approach are students who create their own jobs and get people interested in providing them financial assistance. Students convince local bodies of the need for certain types of service and then organize such services to help themselves and the community. For example, “One young man was interested in starting a radio station and in the process has created a concept of community communications, with community management, supplying a means of response, two-way involvement, a medium for eliciting reactions and mobilizing ideas and energy.” (217). Another got funds for research into manpower needs and related problems. A girl was setting up a sex-information and birth-control center and a boy set up a “draft counseling service.” And collectively “students have wormed their way into many organisations and offices in the city and are having a very direct influence upon emerging community services and design” (218).

Results such as these suggest a kind of education which succeeds in bringing together the best of John Dewey and Mahatma

Gandhi. Where the ordinary colleges fail to prepare the vast majority even for the ordinary role and responsibilities of life, these institutions succeed in enabling some of their students to acquire an ambience in which they discover themselves and through that become truly free individuals—youngsters whose lives have a purpose and who grow up with a sense of mission. In such institutions the staff too, at least those who accept the challenges and responsibilities offered, can discover the happiness which comes from truly satisfying relationships with their students and uplifting experiences of a life full of commitment and love.

Is there a debit side to all this? There is, though, in reality, it does not detract from the system. Most students, we learn, are averse to any confrontation with problems, social ones in particular. College, for them, is a haven where they seek an escape from the often grim realities of life. Besides they look forward to accreditation both to display the papers when need arises and to satisfy themselves and their parents. For some, both staff and students, a main function of education is “packaging”—the neat parcelling of information in walled compartments which the disciplines make possible. Where life in its varied manifestations is the only field of study, “packing” can become an insurmountable problem for minds that are conditioned to compartmentalization.

Part 3 looks forward to “tomorrow’s school.” Here Professor Jerome appears to don the prophet’s garb to foretell what is coming. “Our present schools and colleges will, I believe, wither away and be replaced by much more comprehensive set of institutions serving the whole population: all ages, all classes, continually, on a basis of essentially free access” (313). Mixing belief with expectation, envisages institutions which will provide (a) services now being offered by social workers, employment

agents, travel agents, ministers, doctors, psychologists, teachers, and others, (b) environments conducive to group and individual activities, both academic and social, (c) centres of information that combine the functions of data banks, libraries, museums and rent-all agencies, (d) retreats for escape and recreation, (e) places and facilities to help engage in discovery and application of new (and old) knowledge—our centres of research, (f) child-care centres which combine the roles and responsibilities of all different children's organisations of today but without either their exclusiveness or their usual limitations, and (g) offices for recording and verifying achievements, skill and experiences, etc.

Cumulatively the services and opportunities offered by these institutions/agencies should in quantitative as in qualitative terms, improve upon whatever is now, often inadequately, provided by colleges and other centres of higher learning in the USA. But a more powerful justification for such institutions is the author's hope, largely justified by the case-studies he provides, that they can be made instrumental in introducing those radical reforms which the present system fails disastrously to do because, like the dinosaur, it has lost the capacity to respond to the challenges of the day.

Education which now is a privilege which serves to process the population will become a life-long, continuous process which educational institutions could facilitate without the "ritual of admission" or the "pre-determined requirements of leaving." The main aim of education being to serve the community's learning needs, the tasks of an educational institution will be that of a "kind of broker" helping people find what they need. And the central core of learning will take place between users, not requiring staff. Since this purpose will be served by getting people into the situations and contacts which educate it should be possible to give

services of a high quality at a much lower cost. Nor will it be necessary to waste so much time and energy on evaluation with all its attendant evils and abuses, since certification and accreditation will no longer be the main object of school and, even where these are included as part of the functions of higher learning, they will give information about what a person can do rather than marks, grades and percentages.

Professor Jerome's school of tomorrow will be an "open" institution. It will, in the words of the late Lyndon B. Johnson, be "a shopping center of human services", where everyone can, at any stage in life, shop for his/her needs, the shopping facilities and hours of business being extendable on demand. And if the wares are plentiful and every "shopper" has the capacity to buy what he wants, what reason can there be for tension or trouble or disappointment?

For all its convincing detail and impressive fullness "tomorrow's school" fails to appear as either a fully viable or completely necessary alternative. It may be because, as the author warns us, we university teachers wear blinkers and, like Platonic cavemen, failed to look beyond our limited horizons. Or it could be because the alternative is too good to sound true. But perhaps there is more to it than either of these reasons. For one, I do not believe that university education in the United States has reached a stage where the answers to its problems should be sought outside its present organisation. It has sufficient strength and resilience to fight back and rise above the issues that appear to threaten it today or seemed to question its very existence during the days of American involvement in Vietnam. Nor is it fair to accept a total equation of the university with a "service center" however popular that idea might be today. Service to the community is an important function of every university and it has become more so in our day and time. But the university must

also remain loyal to its original idea and continue to pursue its original aims. It need not be necessarily true that quantity and quality cannot flourish side by side; nor is it necessary or desirable for universities to give up their efforts to nourish talent and encourage excellence. Universities everywhere have a lot to lose if they allow their sensitivity to the ideals of service to dull their sensitivity to the quality and character of the education they offer. The best of them require a two-way responsiveness—to the society that supports them and two scholarship which is both their strength and their goal.

"No one", wrote Thomas Arnold, "ought to meddle with the universities who does not know them well and love them well". Professor Jerome knows the American university fully well and his knowledge is available in the insightful review of some aspects of it that he presents. He loves it intensely and that explains in part his concern for it and his work at the alternatives to save it. Many aspects of the model institutions which he describes require emulation and some almost immediate adoption. But there appears to be another element to the making of this book—the heightened unrest and the apparently explosive situation of the late 1960's. This explains why the author sees less hope and more fear and seeks radical alternatives outside the system. *Culture out of Anarchy* is a highly readable, if a wee bit onesided, account of the current scene in American tertiary-level education. Professor Jerome's review is based on selection, but it is as real as any.

—CHAMPA TICKOO

NOTES

1. Gasett, Jose Ortega Y, *Mission of the University*, Translated by Howard Lee Nostrand, Kegan Paul, 1964.

2. Marcuse, Hergert *Five Lectures* Translated by Jeremy J Shapiro and Shierry M. Weber, Allen Lane the Penguin Press, 1970. Also see his *One-Dimensional Man*, Beacon, 1964,

CONVOCACTIONS

Varsity Education faces uncertain future

—B.D. Nagchaudhuri

WHILE delivering the Convocation Address at the University of Poona Dr. B.D. Nagchaudhuri Vice-Chancellor of Jawaharlal Nehru University said: "higher education in India is not what it once was. It is no longer a sanctuary of learning and a community of quiet discontents leading a life divorced from the turmoil and the profit-seeking of the market place. University degrees have ceased to be an appointment letter and have become more like a passport. Passports are necessary for travel. You cannot travel without them. However, having a passport does not automatically mean that one can travel. Therefore, like the passport as a document of travel, the degree allows one to look for a job. It does not guarantee a job. There was once a time when the number of jobs and the number of degrees had a relationship that degree-holders were less than jobs available. However, it disappeared in the middle thirties to reappear again to the advantage of the degree-holders in forties, becoming again unbalanced to their disadvantage in the mid-fifties and increasingly acute with the succeeding years. From this has flowed a crisis or rather a series of crises which are deeper than lack of jobs and unemployment.

One aspect of the crisis is the questioning of the purpose, meaning and the process of education. Another aspect of the same questioning was the cost of education to the national exchequer and the benefits accruing to the nation therefrom. Vaizy had proposed in the last years of the fifties in the United Kingdom that there was need

to study the economics of the cost of education from the point of view of the benefits to the nation and the expenditure by the nation to sustain, expand and diversify it.

In any nation, he said, a few key political leaders make the basic decision on how much will be appropriated for higher education. Unless educationists can develop the long range understanding of the political leadership in the process and purpose of education in relation to national goals, funds for University education will tend to dry up. Equally important is the performance of a University and its service to the nation, its intellectual integrity. There are no substitute for these. Neither faculty nor students are normally effective in securing funds or support for a University. However, students can play an important role, their reputation for hard work, dedication and their effort to make best use of their opportunity for education at a reasonably low cost can attract the Government to support a University just as much as the faculty performance can.

A large number of people are concerned about education, he pointed out, because it involves their own children and also about youth in general. There is also a belief, sometimes demonstrable that there is a positive correlation between educational development, economic growth and social mobility. However, perhaps the most important thing about education is its quality. There has grown in education in India in recent years a strong tendency of misnamed egalitarianism which manifests in demands for decreas-

ing the burden of work on students and faculty. It is or should be normally counter-productive because as the word spreads about the lessening burden, it can be and often is interpreted by those who give funds that devaluation of education is taking place. Additionally it undermines the confidence of the agencies who recruit products of higher education. A question that has often been raised in India as well as in countries other than our own is that there are M.A.s, M.Phil.s and perhaps overproduction of over specialised and overqualified people such as M.A.s, M.Phil.s, Ph.D.s.

We are today a nation in crisis. A crisis, which, to my mind, is deeper than any we have faced in our 27 years of independent history. Perhaps a deeper crisis than any we have faced in the last 1000 years. Our crisis is compounded of many things, our rural urban imbalances, our lack of resources, our growing population, our lack of will to act, to take risks and above all our unseemly desire to take from an impoverished nation without being disciplined by corresponding willingness to give in return. The rural urban imbalances has caught up with us and the opportunities in the urban sectors and in the Government cannot match the explosive growth of diplomas and degrees.

The deepening crisis of our Universities will not lend itself to simple solutions, he said. There are facets of it which involve the age old Indian ethos which will be difficult to change without clarity and determination. However, a greater sense of reality, some small steps towards a change of our attitude to University studies, a greater emphasis on training in skills and critical faculties rather than in knowledge and facts, a consciousness that if we spend a poverty-stricken nation's money

towards educating ourselves or others, we owe something in return to those who have not the opportunity, perhaps a little more than we have received because we have been so fortunate. Science is no cup-board doll to be occasionally dusted and put back behind glasspanes. It imposes a terrible compulsion to face reality, the reality of discarding unproved faiths and inhu-

man values. University education faces an uncertain future. The criteria for survival include the compulsions of science to reject as well as accept. Fortunately in a large measure the future is likely to be what today's students and inheritors of the future make of it through their own hard work, their hard headed sense of reality and responsibility.

Prof. Nurul Hasan Urges Curricular Reforms

THE Education Minister, Prof. Nurul Hasan while delivering the Convocation Address at University of Madurai pointed out that the reform of the existing courses in the university system (including such ancillary aspects as production of good teaching and learning materials, adoption of new and dynamic methods of communication in which teachers and students learn together, and examination reform) is an urgent need. The introduction of a vocational element in them, to the extent we can identify available job opportunities, would be an important part of such a programme. But the programme curricular reform at the university stage would have to be much wider and comprehensive. It is about some aspects of this reform that I would like to share a few ideas with you, he said.

The objectives of every university course should be two-fold, he said. As an integral part of the university system, it should obviously strive to realise the objectives of university education itself, viz., stimulation of curiosity, cultivation of habits of self-study, development of a capacity to acquire new knowledge and to apply the knowledge acquired for solution of concrete problems, to promote an understanding of the productive processes and a capacity to participate in them, and to inculcate the basic values of commitment to truth and pursuit of knowledge and excellence as well as

an incorruptible faith in our national objectives of democracy, socialism and secularism. In addition, the course should also strive to realise its special objective which depend upon its content and character.

A course in Economics, for instance, he pointed out, may have to promote an understanding of the basic concepts involved or the problems faced in the development of the economy in specific situations. Similarly, the content of every course should be up-to-date in the sense that it incorporates the latest developments in the field. The course must also be of relevance, significance and utility to the students and to the society so that the student is properly motivated to master the course in depth and the society is equally motivated to invest the necessary resources in its provision. In spite of all that has been done in the post-independence period, the fact still remains that several of our courses are out-moded.

A recent study by the Jadavpur University in West Bengal shows that the university courses have remained unrevised for long periods—six to twenty-five years or more, that many of the courses are unrelated to environment and that a large majority of students do not find them challenging or interesting enough. The situation is not very different in all other parts of the country.

It would, therefore, be

necessary, he emphasised, to re-examine all our existing courses at the university stage from the point of view of the objectives they are expected to serve and to revise them on the general principles of relevance, modernisation, significance and utility.

A very important measure to establish the relevance of the courses would be to make an attempt to take it beyond the walls of the class room to the community around, he said.

Once this concept of taking the students beyond the class room to the community is accepted as an integral part of curriculum construction or teaching, the traffic cannot remain one way for long.

There are hundred ways in which this can be done. Depending upon the nature of the course and the skills and interests of the students, the people may be assisted to improve their education, to upgrade their vocational skills, to take necessary precautions to improve health or prevent disease, to take deepening interest in current affairs through readings of newspapers and discussions, and to take effective steps to solve their immediate local problems. If such extension services to the community were to be organised, the people would begin to look forward to the arrival of the teachers and the students from the university system as friends, philosophers and guides. They would also be more responsive and willing to help the field-work on which the education of the students is based. The university system and the community would thus come closer together through a programme of mutual service and support. This is the direction in which our attempts at curricular reform should move.

A time has come, he remarked, when the concept of National Service which is now restricted to the undergraduate stage, is taken a step further. It would be desirable to initiate a programme under which every student who takes his first degree is required to spend one year as

a volunteer in a specified development programme, preferably in a rural area. Depending upon his skills, he may participate in such programmes as literacy classes for adults, non-formal programmes of education for out-of-school youth, universal elementary education, family planning, provision of health services, legal aid to the poor, or upgrading of vocational skills in agriculture or industry.

Higher education, as it is now imparted, has two main weaknesses. On the one hand, it is not integrally related to programmes

of national development. On the other, it tends to alienate the educated persons from the masses and makes them an exploiting rather than a service group. Both these weaknesses would be corrected to a considerable extent if curricular reforms on these lines are carried out. They will integrate education and development together so that we have education through reconstruction and reconstruction through education. They will also end the present widening social dichotomy between classes and the masses and help in creating a more egalitarian society.

ing education more purposeful.

The technologist's ability to analyse is of urgent relevance for our country today, he pointed out. Our development plans call for considerable infusion of technology and technological innovation in their execution. There are two reasons why such technological infusion has to be indigenous, generated by the intellectual effort of our own citizens; first we can not expect to import any significant amount of foreign technology for our industrial development since such import is expensive; as a large country our needs are large, we do not have the wherewithal to fund the technology requirements in foreign exchange; in any case we are never likely to get truly modern technological knowhow; next and more important, the nature and scale of our development problems are in a class by themselves and there is no developed country in the world today to which we can turn for knowledge based on experience relevant to our environment; we have to tackle the task ourselves since we alone are likely to have the patience, stamina and motivation to go to work on it. We must, therefore, depend on our own innovation, evolve our own technology and methodology of development based on our economic and social structure.

The national development plan has a time scale, he said, and owing to the evolving nature of development, the technological skills which will be required will keep changing with time. This is an important aspect to be borne in mind and provides a rationale for serious education planning. The objective of the plan is to project the quantitative manpower requirements foreseen as a function of time, to categorise them into various types of technological skills, and, within each category, to indicate a levelwise breakup. Such a plan will serve the universities in expanding or contracting the availability of seats in the various specialities and in enabling them to guide students to study and train for those types of job openings which will become available at the time of graduation,

Sethna Pleads for Indigenous Technology

THE establishment of the Jawaharlal Nehru Technological University has rightly emphasised the growing importance and indispensability of science and technology to the development of our country, said Dr H.N. Sethna, Chairman, Atomic Energy Commission, while speaking at the First Annual Convocation of Jawaharlal Nehru Technological University at Hyderabad.

The basic task of producing adequately for the people of our country, all their needs and the equally important need for generating increased revenue through the export trade for funding the foreign exchange requirements of our development plans devolve ultimately on the technological ability of the nation. The process of building up such an ability and infusing a steady improvement in the gross national technological capability begins with the process of middle-level and upper-level education, and creation of institutions such as the Jawaharlal Nehru Technological University can go a long way towards strengthening this process. He said it is particularly apt that the name of this University perpetuates the memory of

Jawaharlal Nehru and his keen perception of the important role technology would have to play in the upliftment of this country.

Referring to the University's continuous internal assessment system, he said, this constitutes a powerful motivating factor that keeps the student in the classes and attentive to the course work in a sustained manner, alert for the frequent tests and examinations. The traditional system of year-end examinations made the students attend classes for attendance's sake, or to avoid them as they pleased and take to the books once a year when the examinations were around. The indifference, hostility and frustration evoked in students by the traditional system will be absent in the continuous assessment system, with hope, interest and industriousness replacing the negative attitudes. If the continuous assessment system is coupled with a certain amount of flexibility made available to the student in the matter of course selection, if the student can explore a field of study a little and can drop it or replace it with another more to his liking, a major breakthrough would have been achieved in mak-

Round Up

President Welcomes U.N. Manpower Pool Proposal

THE President Mr. F.A. Ahmed opened the 26th International Congress on Physiological Sciences in New Delhi recently with a call that the developing countries should be "discriminating in the types of research they sponsor."

About 2,000 scientists from all over the world including three Nobel Laureates—Sir Alan Hodgkins, president of Britain's Royal Society, Professor Andrew Huxley Royal Society Research professor, (joint winners of the Nobel prize for medicine in 1963), and Dr Har Gobind Khorana—attended the six-day Congress.

Mr Fakhuruddin Ali Ahmed suggested that International organizations like the present Congress could lay down guidelines to avoid "duplication of efforts" and evolve a coordinated strategy to tackle the manifold health problems in the developing countries.

The President said he was "deeply pained" by the fact that Indian doctors preferred to stay in the more developed countries to the detriment of our own health services. He welcomed the U.N. proposal for starting a manpower pool financed by the developed nations to provide technical expertise to poor countries that had been "robbed of their skilled personnel."

Mr Ahmed felt that the present

training and working pattern of medical colleges in the country had very little relevance to the actual needs of India. Although, the opportunities for medical education had been expanded there had not been enough emphasis placed on the kind of education as well as the type of physicians the country needed.

Referring to the lack of impact of health services on the rural sector, the President suggested that a period of compulsory service for young doctors — somewhat along the lines of house surgery — was necessary. More attention was also required in the field of nutrition since many of the diseases prevalent today could have been avoided had there been more balanced diets.

Dr Karan Singh, Union Health Minister said in his welcome address that though the mysteries of a thousand diseases had been solved, new diseases due to "environmental imbalances and changes in life styles" kept cropping up. Sometimes, even the old diseases returned.

The field for physiologists, according to him was wide open. The Minister said, since "man was an evolving being — not anatomically but psychologically — many of the psychosomatic functions remained unknown.

Dr Yogve Zotterman, President of the International Union of Physiological Sciences informed the scientists that the union had appealed to the International Council for Scientific Union for more funds but with not much success. There would be less money forthcoming.

Dr Zotterman praised the British tradition of physiology which, he said had been followed in India.

The Prime Minister, Mrs. Indira Gandhi, in a message to the Congress stressed the need to reduce the disparities among different nations so that even the poorest could get basic medical facilities.

Mrs. Gandhi said: "It is important that disparities among nations and peoples be abridged and prevented from growing. Medicine is one of the areas where corrective action can be initiated. People may not have equal wealth or status, but basic safeguards of health must be available to them."

Dr Hargobind Khorana expressed the hope that he would soon be able to chemically construct DNA in the laboratory.

Dr Khorana explained with the help of a series of slides what progress he had made in constructing DNA and understanding the "signals" which controlled genes.

Dr Khorana said genes had specific chain structures which distinguished one gene from another.

He had tried to synthesise chemically a gene which could be used as a "template" for the synthesis of a transfer RNA molecule.

He chose the RNA molecule because the sequence of its structure is already known. Also the first thing that a gene makes is RNA.

RNA is the direct product of DNA.

Dr Khorana said he used the known RNA sequence and worked back to arrive at the DNA sequence.

BITS's Dual Degree Programme

THE students at Birla Institute of Technology & Science, Pilani can now work for any two degrees under five year integrated programme consisting B.E. (Hons.) M.A. (Hons.) M.M.S., M.S.S., M. Sc. (Hons.) and four year integrated programme in B.Pharm (Hons.) started from year 1972-73. First time in the beginning of this academic year 56 students are permitted to register for both the degrees simultaneously.

The integrated programmes are designed with a common first year programme for all of the Institute students with branching taking place of M.M.S., M.A. (Hons.) B. Pharm (Hons.) and B.E. (Hons.) M.Sc. (Hons.) at the end of first, second and third year respectively. The registration for second degree in a certain discipline can be made avail-

able only at the time of following its branching or later on.

All these integrated programmes are structured to provide for a great deal of academic flexibility consisting a minimum requirement of common courses and free electives of different faculties, restricted and departmental electives in each discipline at various stages. For the completion of a second degree it is not needed to repeat common courses, only such required number of courses have to be taken which are essential for the purpose.

In the dual degree programme approximately 3 to 30 more additional courses are required for second degree depending upon the combination of the programme. For instance a student registering for a first degree in B.E. (Hons.) Electrical and a second degree in B.E. (Hons.) Electronics has to complete three more courses and in the same way B.Pharm (Hons.) student has to complete near about 30 courses for M.A. (Hons.) in languages as a requirement of second degree. This requires a student more or less one to five semesters beyond the first degree.

NCAER Offers Books Free

THE National Council of Applied Economic Research has offered some of its publications free of cost to Colleges and Universities. These cover a wide range of subjects, like India's Export Potential in selected countries of West, South-East and Far-East Asia, surveys re: Income and Savings, Energy, area development and other topics. The postal charges for a complete set will have to be borne by the interested university/college.

Universities & colleges interested in availing the offer may contact the Registrar, National Council of Applied Economic Research, 11, Indraprastha Estate, Parisila Bhavan, New Delhi-110001.

New Soybean Variety

THE scientists of G.B. Pant University of Agriculture and Technology, Pantnagar have developed a new soybean variety called 'Ankur'. It has recently been recommended for release by 'Central Sub Committee on release of varieties' for cultivation on farmers field. The new variety is suitable for cultivation in U.P., Bihar, West Bengal, M.P., Maharashtra. Ankur is very pro-

ducing variety evolved in Indian conditions.

The plants are, normally, 60 to 90 cm. tall, branching type with dark green leaves. The new variety is very good in germination, that is why it has been named 'Ankur'. It may be pointed out that germination has been one of the major problems for soybean cultivation in India. Now with the emergence of this new variety, soybean cultivation is expected to get a boost. It is resistance to shattering, suitable for early as well as late sowing. For one acre sowing about 30 kg seeds is required. The crop flowers within 40-45 days after sowing and matures in 106 to 130 days depending upon place and date of sowing. The unique feature of this variety is its resistance to rust, bacterial pustules and macrophomina under field conditions. The grains are yellow in colour and medium in size. The protein content varies between 41 to 45 per cent and oil content between 21 to 25 per cent.

Vikram V.C. Honoured

THE Indo-Soviet Peace and Friendship Society has awarded the 'Soviet Land Peace and Friendship' Award to Dr. Shiv Mangal Singh 'Suman', Vice-Chancellor of the Vikram University, Ujjain for his collection of poetry 'MITTY KI BARAAT'. The Award was made at New Delhi last month by the President of India. The Award consisted of one Gold Medal, a Certificate of Appreciation and a cash award of Rs 8,000/- with 15 days' trip to U.S.S.R. Dr. Suman received the Award in person.

It may be recalled that earlier on the occasion of the Republic Day this year the Kulpati Dr. Shiv Mangal Singh 'Suman' was awarded 'Padma Shri', the President's Award for his contribution to Art and Literature.

New Department Opened

BHOPAL University, Bhopal, has started the department of Bio Sciences and Regional Planning and Economic growth Deptt. with the concurrence of the University Grants Commission and MP Uchcha Shiksha Anudan Ayog, Bhopal from the current academic session i.e. 1974-75. Admissions have been finalised and classes have been started for the current session.

Centre suggests Educational Cess

An educational cess, like the cess on industry for research and development, is understood to have been suggested by the Centre to state governments to overcome the present serious shortage of funds. The ministry of education has, in the meanwhile, also strongly protested to the Planning Commission for the additional cut of 10 per cent in the plan allocation for production.

According to the Minister of Education, Prof. Nurul Hasan, the drastic cut in the allocation for education would, in the long run, affect the economic development and the overall plan objectives. The ministry has taken the stand that the low priority given to education in the plan was a short sighted policy.

The present cut of 10 per cent would bring down the plan allocation for education to almost half of what was originally proposed by the ministry. The Planning Commission appears to have suggested that the funds for education would have to be cut to just about Rs. 1,550 crores.

As a result of these cuts it is feared that the entire programme to reorient the education system

with the object of enrolling all those in the age group of 6 to 11 and changing the school curricula to meet the needs of the agricultural economy and schemes of self-employment, would be severely affected.

Narotham Reddy Felicitated

Education Minister Mr. M. V. Krishna Rao paid rich tributes to Mr. N. Narotham Reddy, Vice-Chancellor of the Osmania University for his administrative ability and dynamism.

Unveiling a portrait of the Vice-Chancellor at a function organised at the Hyderabad YMCA by the Telugu Bhasha Sangham, Mr. Rao praised the efforts of the Vice-Chancellor in conducting the entrance test for admission to post-graduate courses and said under his able leadership the University would surely

have better prospects and improvement.

He described Mr. Narotham Reddy as one possessing a noble and gentle heart and said that Mr. Reddy was responsible for restoring peaceful atmosphere in Osmania University. He was confident that Mr. Reddy would be able to inculcate a high moral standard among the students, which every student ought to possess for accelerating our national progress.

Presenting a memento to Mr. Narotham Reddy, Dr. Ch. Devananda Rao, Minister for Tourism said that he was happy that one of our great sons of the soil Mr. Narotham Reddy was honoured for the yeomen service rendered in several fields, which he richly deserved.

Dr. Devananda Rao said that Mr. Narotham Reddy's understanding of man and matters and rich experience in various fields of public life would put Osmania University on the educational map of the world.

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1. Offers are invited on behalf of the University of Jammu from Architects for rendering professional services in connection with preparation of:
(a) a detailed lay-out plan of the new University Campus (area 125 acres) at Bahu Wali Rakh, Jammu, and
(b) designs of buildings proposed to be constructed during the Fifth Plan (1974-75 to 1978-79) and their supervision.
2. The interested architects should be registered members of the Indian Institute of Architects and must have sufficient experience of designing academic complexes.
3. Tender documents containing full particulars and terms and conditions with details of site and surroundings can be had on written application from the Registrar, University of Jammu, Jammu (Tawi)-180001, upto **20th of December, 1974**, on payment of Rs. 100/- (Rupees one hundred) in crossed Postal Order/Bank Draft payable to the Registrar, University of Jammu at Jammu (Tawi). The cost of tender documents is non refundable.
4. The sealed tenders complete in all respects will be received in the office of the Vice-Chancellor, University of Jammu, Jammu (Tawi)-180001, J & K State, upto 4.00 p.m. of **31st December, 1974**. The tenders will be opened on the same day at 4.00 p.m. in the presence of those tenderers who are present.

For and on behalf of the
UNIVERSITY OF JAMMU

Sd/- (J. D. Sharma)
VICE-CHANCELLOR

PHYSICAL SCIENCES

Mathematics

1. Bhagwan Sahai. Some problems in the theory of rotating fluids. Meerut University
2. Jha, Rama Kant. The domain of convergence of the Fourier series representing the perturbation function in the restricted problem of three bodies. Bhagalpur University.
3. Krithivasan, Kamala. Studies in parallelism and picture languages. University of Madras.
4. Ojha, S.N. A study of some properties of the special functions of q-dimensional spherical harmonics. University of Jabalpur.

Physics

1. Ashok Kumar. Interactions of charged particles with atmospheric gases. Meerut University.
2. Banerjee, Purobi. Positive ion composition and chemistry in the ionosphere and their implication. University of Delhi.
3. Borle, Wasant Namdeo. Studies on silicon crystal growth. Nagpur University.
4. Das, Hira Lal. Effect of strain on the ultrasonic attenuation in the superconducting and normal states of pure tin and study of the dislocation damping mechanism. University of Delhi.
5. Dnyanu, Lawangar Ramchandra. Luminescence studies of CaS, Bi, Pd phosphors. Shivaji University.
6. Nambi, K.S.V. Thermoluminescence of rare-earth doped calcium sulphate phosphors. Gujarat University.
7. Navaneeth, Guduvanchari Natarajan. Studies in gaseous electronics with particular reference to the role of the dielectric walls in the Joshi effect. Nagpur University.
8. Ramachandra Rao, S. Ultrasonic velocities and allied parameters in solutions of non-electrolytes. Osmania University.
9. Thareja, Raj Kumar. Raman processes in atoms in intense electromagnetic field. University of Delhi.
10. Varughese, K.I. X-ray structure analysis of organic molecules. University of Madras.
11. Vidhani, Thakur. Non-perturbative approaches in field theory. University of Delhi.
12. Yadava, Abhimanyu Singh. Investigations on the correlation of dielectric behaviour of powder and bulk. Meerut University.

Chemistry

1. Agarwala, Ramesh Chandra. A study on the chemistry of transition metal complexes of nitrogen and oxygen containing ligands. Meerut University.
2. Balasubramanian, K. Studies in homocyclic chemistry. University of Madras.
3. Bambharolia, Mansukhlal Karamashibhai. Studies on organomercurials. Sardar Patel University.
4. Dubey Maheshchander. Thermodynamic study of some cadmium complexes. Vikram University.
5. Dutta, Krishna. Investigation on the analysis of trace amounts of inorganic substances. University of Burdwan.
6. Jagdish Pal Singh. Physico-chemicals studies on the reactions of octa-coordinated metal cyanides. Meerut University.

7. Jain, Devendra Kumar. Mechanistic studies of oxidation reactions of carbohydrates (Oligosaccharides and polyuronides) isolated from bamboo. Meerut University.

8. Kendurkar, Purshottam Shivram. Studies on ylids. Kanpur University.

9. Lingaiah, P. Physico-chemical studies on transition metal chelates. Osmania University.

10. Locker, Agnes Lelia Mark Eric. Spectral studies of zirconium. Karnatak University.

11. Mandal, Prabhat Kumar. Studies on the viscosity of electrolytic solutions. University of Burdwan.

12. Mukhopadhyay, Sankar Narayan. Hydrodynamics and liquid extraction studies in hydrocyclone. University of Burdwan.

13. Nanjan, M.J. Kinetic studies on the bromination of certain substituted anilides, anisoles and phenols. University of Madras.

14. Roy, Anarendra Nath. Interaction of clay and an organic ion exchanger with some small peptides and gelatin. University of Delhi.

15. Seshavataram, S.K.V. Search for physiologically active compounds: Synthesis of some substituted 4-quinazolones. Osmania University.

16. Sharma, Kailash Chandra. Spectral data *vis-a-vis* nephelauxetic effect and stereochemistry of some metal complexes of nitrogen and oxygen donor ligand. Meerut University.

17. Sharma, Surendra. Studies on hydrogen bonding and molecular aggregation. I.I.T., Delhi.

Earth Sciences

1. Haldar, Kashi Krishan. Petrological investigation of the basic intrusives around Chirmiri District, Surguja, Madhya Pradesh. Vikram University.
2. Lakshminarayanan, M.K. Anorthosite-charnockite complex of northern slopes of Palani Hills, Madurai District, Madras. University of Madras.
3. Ramachandra Murty, A.S. Ice nucleation studies by drop freezing technique. Andhra University.
4. Ranga Rao, Mandola Pandu. Hydrogeological investigations and aquifer characteristics of tube wells in granite terrain. Osmania University.
5. Sen, Subhasis. A study on the petrographic nature of some Indian coals. Nagpur University.
6. Veerraju, N. Genesis of bauxites from Anantagiri Hill ranges, Vishakhapatnam District, Andhra Pradesh, with special reference to geochemistry of bauxitisation. Andhra University.

Engineering & Technology

1. Avadhanulu, M.B. Exploration of the equatorial D-region by sounding rocket techniques. Andhra University.
2. Chhalotra, Gaya Prasad. Some investigations in sequence components. University of Jabalpur.
3. Dhar, Pyare Lal. Optimization in refrigeration systems. I.I.T., Delhi.
4. Majumdar, Alok Kumar. Flame stabilization by wall reicess. University of Burdwan.
5. Mukhopadhyay, Sankar Narayan. Hydrodynamics and liquid extraction studies in hydrocyclone. University of Burdwan.
6. Sarkar, Ranjit Kumar. Studies on graft copolymerisation of wool using some acrylate monomers. I.I.T., Delhi.

BIOLOGICAL SCIENCES

Anthropology

1. Derasari, Atula Jamubhai. A developmental study of anthropometric measurements during the first fifteen months of life. M.S. University of Baroda.

Biology

1. Joel, D. Rajasingh. Studies on the biology and fisheries of the edible portunid crabs of the Pulicat lake. University of Madras.

Biochemistry

1. Banerjee, Uma. Effect of different levels of pulse proteins and amino acids on lipid metabolism. Nagpur University.

Botany

1. Chattopadhyay, Sukumar. Production of extracellular lysine by microorganisms. University of Burdwan.
2. Dattatraya, Karekar Muralidhar. Physiological studies in plants of Konkan. Shivaji University.
3. Das, Ajit Kumar. Studies on the utilization of algae in industrial photosynthesis. Kanpur University.
4. Jayakaran, M. Experimental studies on the effects of fluorene-carboxylic acid derivatives on *Capsicum annum* and *Abelmoschus esculentus*. University of Delhi.
5. Joshi, Syamasunder Balambhat. Histochemical and embryological studies in monocots pre and post fertilization studies in some members from Karnatak. Karnatak University.
6. Koul, Rita. Ecology and physiology of *Hemigraphis dura*. Vikram University.
7. Kushari, Debi Prasad. Physiological and biochemical control of adventitious root formation in hypocotyl cuttings of *Phaseolus mungo* (L.) and leaf cuttings of *Coleus blumei* (Benth.). University of Burdwan.
8. Maheshwari, Radha Kant. Studies on the antiviral activity of growth products of fungi. Kanpur University.
9. Parabia, Minoo Hiraji. A contribution to the cyperaceae of Gujarat State. Sardar Patel University.
10. Patel, I.M. A comparative study of physiology of blue-green and green algae. Gujarat University.
11. Santra, Sandhya. Investigations on three strains of *Fomes durissimus* (Lloyd) associated with decay of economic trees and timbers. University of Burdwan.
12. Sathe, Padmakar Gangadhar. Studies in taxonomy, physiology of some genera follicolous and woody saprophytic fungi from Maharashtra. Marathwada University.
13. Venkata Subbaiah, K. Physiological and biochemical studies on plant tissues grown in sterile cultural. M.S. University of Baroda.

Zoology

1. Bhaskar, C. Raman. Studies on mitochondria during oogenesis and early embryogenesis in *Cyprinus carpio*. Vikram University.
2. Yadav, D.C. Taxonomy and life cycle of digenetic trematodes parasitic in reptiles and birds. University of Jabalpur.

Agriculture

1. Jindal, Prem Chand. Studies on salt tolerance of mango, *Mangifera indica* (L.). Haryana Agricultural University.
2. Mohanty, Narendranath. Studies on udbatta disease of rice. Orissa University.
3. Pakhiya, Rama Shankar. The consumption, digestion and utilization of feed plants by the larve of mustard saw fly,

Atholia proxima (Klug) and its digestive physiology. Kanpur University.

4. Ram Singh. Studies on the unproductiveness of Thompson seedless cultivar of grapes, *Vitis vinifera* (L.). Haryana Agricultural University.

5. Saini, Madan Lal. Cytogenetical investigations in species and species hybrids of Eu-sorghum. Haryana Agricultural University.

SOCIAL SCIENCES

Psychology

1. Chaya. An investigation into certain psychological characteristics of an effective school teacher. Kanpur University.
2. Natarajan, V. The influence of fear and its interacting variables on opinion and behaviour change. University of Madras.

Political Science

1. Colmenares, Serafin P. Philippine Malaysian relations with special reference to the sabah issue. University of Delhi.
2. Deshmukh, Pramod Kumar. A study of the doctrine of judicial review in India. University of Jabalpur.
3. Mira Devi. Gandhian conception of a non-violent democracy. Meerut University.
4. Mital, Shanti Swarup. The social and political ideas of Swami Vivekananda. Meerut University.
5. Tyagi, Sudhir Datta. The administration of North East Frontier Agency (Arunachal Pradesh). Meerut University.

Economics

1. Bhatia, Harbans Lal. Liquidity of public debt in India. University of Delhi.
2. Bhatia, Usha. A study of certain backward regions of Uttar Pradesh. Meerut University.
3. Sneh Prabha. Working of sugar industry in India, with special reference to Uttar Pradesh. Meerut University.

Education

1. Desai, S.H. Construction and standardization of tests of language development of Gujarati children of the age group 3 to 5. Gujarat University.
2. Dewal, Onkar Singh. A study of difficulties in teaching English and effectiveness of programmed teaching : A systems perspective. M.S. University of Baroda.
3. Lavingia, K.U. A study of job satisfaction among school teachers. Gujarat University.
4. Patel, Jayantibhai Zaverbhai. Construction and standardization of general ability test for Classes V, VI, VII. Sardar Patel University.
5. Patel, Motibhai Tribhuvandas. Construction and standardization of general ability test for Classes VIII, IX and X. Sardar Patel University.
6. Shrivastava Prem Lata. A psycho-social study of some factors associated with interest of boys and girls. Kanpur University.
7. Surendra Kumari Singh. A study of the relationship between verbal interaction of teachers in class-room and attitude towards teaching with special reference to B.Ed. students. Meerut University.

Commerce

1. Bothra Darshan Singh. Underwriting of capital issues in India. Vikram University.

Management

1. Donald Somasundaram J. The study of management by systems analysis and systems synthesis : An application of the approach to the cable industry. University of Delhi.
2. Prasanna Chandra. An assessment of the influence of certain corporate financial economic variables on equity share prices in India. Osmania University.

HUMANITIES

Philosophy

1. Sinha, Himmat Singh. A comparative study of the philosophicoethical doctrines of communism and anasakti yoga. Meerut University.
2. Sita Ram Reddy P. Gandhiji's philosophy of sarvodaya. Osmania University.

Religion

1. Kailash Behari Singh. Nanak panthi (Sikhetar) sant parampar. Magadh University.

Literature

English

1. Dwivedi, Amar Nath. Indian thought and tradition in T.S. Eliot's poetry. Meerut University.
2. Sharma Bahama Dutta. The projection of a spiritual vision in John updike. Meerut University.
3. Sharma, Narendra Kumar. Expressionism in the plays of Eugene O'Neill. Meerut University.

Sanskrit

1. Bhatt, J.K. Shrimad Bhagwat Gita : A critical study with special reference to Shanker's interpretation of the same. Saurashtra University.
2. Govil, Santosh. A study of the Ascharyachudamani. University of Delhi.
3. Jain, Shikhar Chand. A study of the Siva-Bharat Maha-kavya. University of Delhi.
4. Pal, Sarita. Mahabharat ke katha per aadharit Sanskrit natkon ka adhyayan : Navam shatabdi se unoesvin shatabdi parvanti. Meerut University.
5. Patel, Vasantilal Chhaganlal. Sanskrit sahityama nakatha : Ek adhyayan. South Gujarat University.
6. Pathak, Madan Mohan. Bhavbhuti ke natakon mein prematrikvyanjana. Kameshwarsingh Darbhanga Sanskrit University.
7. Shrivastava, Brijesh Chandra. Yamak kavyon ke prampara mein mahakavi Shri Vasudev ka sathan. Kanpur University.

Hindi

1. Agnihotri, Mohini. Nirala ke gadya sahitya ka anusheelan. Vikram University.
2. Arti, Durga Pathak. Chattisghadi aur Bundeli lok geeton ka tulnatmak adhyayan. University of Jabalpur.
3. Bhargava, Prem. Swantervottar Hindi upanyason ka samajshastriya anusheelan. Vikram University.
4. Gupta, Nathoolal. Vidharbh kshetriya Hindi sahitya ke kramik vikas ka anusheelan. Nagpur University.
5. Kamala, A. Kanhaiyalal Mishra Prabhakar ke sahityik kritiv ka jiwapvratiya adhyayan. Meerut University.
6. Kaushik, Ram Krishna. Nirala-kavya mein abhivyajanoshilp. Meerut University.
7. Mahesh Chandra. Ramcharitmanas ka samajshastriya adhyayan. Meerut University.
8. Maurya, Krishna. Adhunik Hindi upanyason ka samajshastriya adhyayan. University of Jabalpur.
9. Mishra, K.N. Adhunik Hindi kavita ka shilp vikas. Gujarat University.

10. Nanavati Chandrika, V. Psychological approach in modern Hindi novels after independence. S.N.D.T., Women's University.

11. Ravi Prakash. Hindi kavyashastra mein ras swarup : Ek punarmulyankan. Sardar Patel University.

12. Sachdeva, Kusum. Sanskrit natkon ka Ramchandrika per prabhav. Meerut University.

13. Sahu, Jagannath. Nai kavita aur uske vacharik prishthbhoomi. Vikram University.

14. Sabhu, Ram Bharosai. Bundeli lok geeton ka sanskritik evam sahityik vivechan. Kanpur University.

15. Sharma, Ishwari. Hindi ke chhayavadi kavita aur nai kavita : Sankarman ke sopan aur prikritiya. Sardar Patel University.

16. Sharma, Krishna Datt. Hindi bhasha mein punrukti. Meerut University.

17. Sharma, Prabhudyal. Gwalior zile ke gramya jivan shabdawali. Jiwaji University.

18. Subba Rao, G. A comparative study of the poetical works of Jayashankaraprasad and Sri Viswanatha Salyanarayana. Andhra University.

19. Susheela Anna, B. An investigation into the social environments in Hindi literature of bhakti period. University of Cochin.

20. Urmila Singh. Chhayavadi kavya mein bhakti tatwa. Magadh University.

21. Ved Prabha. Hindi ke mahakavyatamak upanyason ka alochnatmak adhyayan. Meerut University.

22. Verma, Roop Lal. Kulpati Mishra : Kavi aur acharya. University of Delhi.

23. Vishisht, Kamal Kishore. Prasadottar Hindi rangmanch ka adhyayan. Jiwaji University.

Gujarati

1. Bhadelawala, S.C. The folk literature of the cattle breeders of Halar District with special reference to their culture. Saurashtra University.

Telugu

1. Raghuma Reddy, Y. Social life in Telugu folksongs. Osmania University.

Fine Arts

1. Nirmala. Rajasthani chitrakala mein nari ka ankan. Meerut University.

History

1. Balambal, V. History of South India between A.D. 800-1070 A.D. with special reference to feudatories. University of Madras.
2. Mahaswaminaha, Sha Brahm Pattadyaksha Sadyojatha Shivacharya. The saiva and virasaiva mathas in Karnatak. Karnatak University.
3. Mehrotra, Sureshchander. Indian career of Sir Charles Metcalfe, 1801-1837. Vikram University.
4. Parikh, Rameshkant Govindlal. The social economic and political ideas of Maharaja Sayaji Rao III of Baroda. M.S. University of Baroda.
5. Sharma, Ghanshyam Dutt. Politics and administration in the State of Marwar 1638-1749 A.D. Jawaharlal Nehru University.
6. Sinha, Keshav Nandan. The Anglo-Bhonsle relations, 1772-1818. Vikram University.
7. Trivedi, Dharni Dhar. Lag nidhar tatha unka kal. Meerut University.

Geography

1. Saxena, Madhuri. Geographical analysis of industrial pattern of Meerut District. Meerut University.

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Registrar

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November 28, 1974.

M.A. CHISHTI
Registrar

CURRENT DOCUMENTATION IN EDUCATION

A List of select articles culled from Periodicals received in AIU
Library during November-December 1974

ADULT EDUCATION

- Conrad Glass, J. and Harsberger, Richard F. "Full-time, middle aged adult student in the higher education." *Journal of Higher Education* 45(3); March 74 : 211-18.
- Fisher Short, W. "Urbanisation and adult education." *Indian Journal of Adult Education* 35(6); June 74 : 3-6
- Kapur, J.N. "Continuing education." *University News* 12(10); Oct 74 : 1.
- Scully, Malcolm G. "British Open U. courses found unsuitable for disadvantaged." *Chronicle of Higher Education* 8(34); 28 May 74 : 1-2.
- Semas, Philip W. "Workers sabbaticals eyed as key to lifelong education." *Chronicle of Higher Education* 8(24); 18 Mar 74 : 1.
- Swaminathan, Miss. "Creative drama for young adults." *Indian Journal of Adult Education* 35(6); June 74 : 7-9.
- "Workshop on Autonomous Colleges." *University News* 12(10); Oct 74 : 4-6.

EDUCATION SOCIOLOGY

- Chittaranjan, C.N. "Youth : Wages of neglect." *Mainstream* 13(1-4); Annual 1974 : 37-9.
- Das, B.C. "Educated youth." *University News* 12(10); Oct 74 : 9-10.
- Das, Bhaskar Chandra. "Academic indiscipline." *University News* 12(11); Nov 74 : 1-8.
- Lindquist, Jack. "Political linkage : The academic innovation process." *Journal of Higher Education* 45(5); May 74 : 323-43.
- MacLure, Mary. "Freshers week : American style." *Times Higher Education Supplement* (158); 25 Oct 74 : 8
- Magarrell, Jack. "Startling shifts found in youths' views of work, morals." *Chronicle of Higher Education* 8(34); 28 May 74 : 3.
- "No excuse for ignorance." *I.I.E.E. Bulletin* 31 July 74 : 13.
- Scully, Malcolm G. "Signs of a counter-reformation hearten academic conservatives." *Chronicle of Higher Education* 8(24); 18 Mar 74 : 1.
- Sharma, K.L. "Educational inequalities among Rajasthan's scheduled castes." *Economic and Political Weekly* 9(37); 14 Sept 74 : 1589.

EDUCATIONAL PLANNING & ADMINISTRATION

- Bogue, E.G. and Riggs, R.O. "Institutional policy and its abuses." *Journal of Higher Education* 45(5); May 74 : 355-63.
- "Development Plan of Mithila University." *University News* 12(11); Nov 74 : 12-14.

"In Full : The education and training programme of the Commonwealth Fund for Technical Co-operation." *A.C.U. Bulletin of Current Documentation* (14); June 74 : 16-18.

- Ramamurthy, M.S. "Universities and the public." *University News* 11(9); Sept 74 : 4-5.
- Richardson, Richard C. "Governance theory : A comparison of approaches." *Journal of Higher Education* 45(5); May 74 : 344-54.

Sievert, William A. "Cheating on teaching loads is investigated in California." *Chronicle of Higher Education* 8(24); 18 Mar 74 : 2

"Vice-Chancellors take fright (Editorial)." *Times Higher Education Supplement* (152); 13 Sept 74 : 12.

ECONOMICS OF EDUCATION

- Boyer, Ernest L. "Who should pay." *Chronicle of Higher Education* 8(30); 29 Apr 74 : 24.
- Lockwood, Geoffrey. "Economic advantages of local cooperation." *Times Higher Education Supplement* (152); 13 Sept 74 : 14.
- "Shortening of university courses proposed in the Philippines." *I.I.E.E. Bulletin* 31 July 74 : 5.

EDUCATIONAL TECHNOLOGY

- Magarrell, Jack. "Two systems of teaching by computer to be tested." *Chronicle of Higher Education* 8(30); 29 Apr 74 : 11.
- Scully, Malcolm G. "Video on campus : Where's the revolution?" *Chronicle of Higher Education* 8(34); 28 May 74 : 9-11.

COMPARATIVE EDUCATION AND COUNTRY STUDIES

- Ghosh, D.K. "Changing character of universities in India." *University News* 11(9); Sept 74 : 10-11.
- Lockwood, Geoffrey. "Internationalization stressed as way forward." *Times Higher Education Supplement* (155); 4 Oct 74 : 11.
- Nelson, Fred A. "Has the time gone for an external degree?" *Journal of Higher Education* 45(3); Mar 74 : 174-83.
- "Putting head and hands to work." *I.I.E.E. Bulletin* 31 July 74 : 12.
- Wagner, Leslie. "These forces may open higher education to all." *Times Higher Education Supplement* (152); 13 Sept 74 : 14.
- "Workshop on higher education : Autonomous colleges, examination reforms, development of post-graduate education." *University News* 11(9); Sept 74 : 8-9.



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